Pacific Herring Coded Wire Tagging Study: 2003 Releases and Recoveries

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ABSTRACT

Flostrand, L., and J.F. Schweigert. 2004. Pacific herring coded wire tagging study: 2003 releases and recoveries. Can. Tech. Rep. Fish. Aquat. Sci. 2534: 57 p.

The results from tagging spawning Pacific herring in British Columbia during March and April of 2003 and searching commercial roe herring catches in 2003 to recover tags are presented. A total of 326,732 herring were tagged and released, of which 95,890 were tagged in Areas 14 and 16 in the Strait of Georgia, 119,342 were tagged in Areas 7, 8 and 9 in the Central Coast and 111,500 were tagged in Areas 4 and 5 in the Prince Rupert District. Almost 25% of the total 2003 British Columbia roe herring harvest, equivalent to 7,172 metric tonnes, was searched for coded wire tags at three fish processing plants. The percentage of regional catches searched for tags among the 5 coastal stock assessment regions varied from 13 to 46%. A total of 1,148 tagged herring from five release years were recovered. With respect to each year of release, there were 12 recoveries from 1999; 6 recoveries from either 1999 or 2000; 94 from 2000; 179 from 2001; 524 from 2002 and 333 from 2003. Forty-one inter-regional strays were observed. One stray was from a 1999 Strait of Georgia release recovered in the west coast of Vancouver Island; 5 strays were from 2000 Strait of Georgia releases recovered in the west coast of Vancouver Island; 10 strays were from 2001 Prince Rupert District releases recovered in the Central Coast; 1 stray was from a 2001 Strait of Georgia release recovered in the west coast of Vancouver Island; 18 strays were from 2002 Prince Rupert District releases recovered in the Central Coast; 4 strays were from 2002 Central Coast releases recovered in the Strait of Georgia, and 2 strays were from 2002 Strait of Georgia releases recovered in the west coast of Vancouver Island. In addition to regional strays, there were 196 Area strays. Observed tag recovery data were related to roe herring catches and tag search efforts. Using data from specific recovery and release events, estimates were determined for the number of tags recovered per number of tags released; the number of tags recovered per tonne of roe herring searched; the number of tagged herring removed by the 2003 roe herring fisheries, and the number of tagged herring removed from the population per number of tags released.

RÉSUMÉ

Flostrand, L., and J.F. Schweigert. 2004. Pacific herring coded wire tagging study: 2003 releases and recoveries. Can. Tech. Rep. Fish. Aquat. Sci. 2534: 57 p.

Nous présentons les résultats du marquage de harengs du Pacifique géniteurs réalisé en mars et en avril 2003 en Colombie-Britannique et de la recherche de poissons marqués parmi les prises commerciales de harengs rogués de 2003. Au total, 326 732 harengs ont été marqués et remis à l'eau, dont 95 890 dans les zones 14 et 16 (détroit de Georgia), 119 342 dans les zones 7, 8 et 9 (côte centrale) et 111 500 dans les zones 4 et 5 (district de Prince Rupert). Presque 25 % des prises de harengs rogués effectuées en C.-B. en 2003, soit 7 172 tonnes, ont été vérifiées dans trois usines de transformation du poisson, afin de trouver celles qui portaient des micromarques codées. Parmi les cinq régions côtières d'évaluation des stocks, le pourcentage des prises soumises à cette recherche a varié de 13 à 46 %. Au total, 1 148 harengs qui ont été marqués au cours de cinq années différentes ont été trouvés. Douze des harengs avaient été marqués en 1999; 6 en 1999 ou 2000; 94 en 2000; 179 en 2001; 524 en 2002 et finalement 333 des harengs avaient été marqués en 2003. Quarante et un de ces poissons avaient été recapturés dans une région différente de celle où ils ont été marqués: un a été remis à l'eau dans le détroit de Georgia en 1999 puis recapturé sur la côte ouest de l'île de Vancouver, cinq ont été remis à l'eau dans le détroit de Georgia en 2000 puis recapturés sur la côte ouest de l'île de Vancouver, dix ont été remis à l'eau dans le district de Prince Rupert en 2001 puis recapturés sur la côte centrale, un a été remis à l'eau dans le détroit de Georgia en 2001 puis recapturé sur la côte ouest de l'île de Vancouver, dix huit ont été remis à l'eau dans le détroit de le district de Prince Rupert en 2002 puis recapturés sur la côte centrale, quatres ont été remis à l'eau sur la côte centrale en 2002 puis recapturés dans le détroit de Georgia, et deux ont été remis à l'eau dans le détroit de Georgia en 2002 puis recapturés sur la côte ouest de l'île de Vancouver. De plus, 196 harengs marqués ont été recapturés dans une zone différente de celle où ils ont été marqués. Le rapport entre les données de harengs marqués-retrouvés versus la quantité de harengs rogués pêchés et l'effort de recherche de poissons marqués a été établis. En se basant sur les données recueillies lors d'événements spécifiques de marquage-recapturage des estimés ont été calculés pour: le nombre de hareng marqués-retrouvés par rapport au nombre de harengs marqués; le nombre de hareng marqués-retrouvés par tonne de harengs verifiés; le nombre de harengs marqués -pêchés lors de la pêche de harengs rogués en 2003, et puis le nombre de harengs marqués-pêchés lors de la pêche de harengs rogués en 2003 par rapport au nombre de harengs marqués.

INTRODUCTION

The application of coded wire tags (CWT) in Pacific herring began in 1999 and tag recovery from searching roe herring catches began in 2000. The primary purpose of the multi-year tagging study is to increase understanding of herring stock structure and inter-annual fidelity to spawning sites. Characterizing spatial and temporal patterns of spawning behaviour is critical to the effective management of the resource. This report summarises results of the 2003 Pacific herring CWT release and recovery work.

Pacific Fishery Management Area Regulations of the Canadian Fisheries Act identify 30 Management (or Statistical) Areas along the British Columbia (BC) coast, herein referred to as Areas, Figure 1. These Areas are used for fishery management, enforcement and catch reporting purposes. Specifically for Pacific herring management and stock assessment purposes, there are five herring stock assessment regions, numerous Area subdivisions, and several subdivisions within each Area referred to as herring sections (Rusch et al 2003; Schweigert 2004; Midgley 2003). The five herring assessment regions are comprised of: 1) the Queen Charlotte Islands (QCI), south-east portions of Area 2E; 2) the Prince Rupert District (PRD), Areas 3 to 5; 3) the Central Coast (CC), Area 7 and portions of 6 to 8; 4) the Strait of Georgia (SG), Areas 14 to 19 and portions of 13 and 29, and 5) west coast of Vancouver Island (WCVI), Areas 23 to 25.

As in 2002, the objectives of the 2003 CWT study were to tag herring in the SG, CC and PRD assessment regions and to search representative portions of regional roe herring harvests for CWTs by combining search efforts at three Vancouver-Lower Mainland fish processing plants. Prior to 2003, CWT release efforts occurred in the SG (1999 to 2002), the QCI (1999), the CC (2002) and the PRD (2001 and 2002) and searching of roe herring catches for CWTs occurred in 2000 to 2002 (Flostrand and Schweigert 2002, 2003). Approximately 678,000 tags were released from 1999 to 2002 and approximately 1,283 inter-annual and 2,388 in-season tags were recovered from 2000 to 2002 roe herring fisheries combined. Three regional strays were observed in 2000, 1 regional stray was observed in 2001 and 4 regional strays were observed in 2002. In 2000, 21.3% of the coast-wide roe herring harvest, equivalent to 6,222 metric tonnes (mt), was searched for tags; in 2001, 28.8% of the coast-wide roe herring harvest, equivalent to 6,922 mt, was searched for tags, and in 2002, 31.8% of the coast-wide roe herring harvest, equivalent to 8,468 mt, was searched for tags. More details on the progress of the study can be found in Schweigert and Flostrand (2000) and Flostrand and Schweigert (2002, 2003). This report summarises results of the 2003 Pacific herring CWT release and recovery work.

METHODS

TAGGING AND RELEASING HERRING

In 2002, herring were caught, tagged and released in the SG (Area 14, Figure 2), the CC (Areas 6 to 8, Figure 3) and the PRD (Areas 4 and 5, Figure 4). The tagging charter extended from March 4 to12 and March 16 to April 5, including vessel preparation, travel, and weather. Tagging activities occurred on 16 days during this period. The tagging equipment and operational methods were essentially the same as in previous years (Schweigert and Flostrand 2000, Flostrand and Schweigert 2002, 2003). As in 2002, the tagging vessel was the Ocean Marauder, a 26.5 m long vessel that used table seining rather than drum seining to capture herring for tagging. The Ocean Marauder was the only vessel that captured herring for tagging and only one size of purse seine net was used, which was approximately 274 m x 33 m. All tag insertions were done into the muscle tissue directly behind the skull of the herring (also referred to as the nape site) and fish were not anaesthetised. Binary and decimal CWT codes were applied and a unique set of tag codes or code sequences was used for each tagging session. To evaluate variation in recovery rates due to physical conditions of groups of fish, unique sets of tag codes were used to differentiate tagging intervals. Intervals differed by starting time from the beginning of a tagging session and by the general condition of the fish. Intervals were from 20 to 70 minutes and fish conditions were given ratings of good; good-fair; fair; fair-poor; poor and very poor depending on the overall behaviour and appearance of the fish being tagged. A representative biological sample was collected during each tagging session to collect information on fish age, sex, maturity, length and weight compositions. Samples for DNA analysis were also taken from some of the sets. As in 2002, no recovery pen was deployed to temporarily hold fish after tagging. Instead, seawater was sprayed over and around the release outlet from a power hose to shield tagged herring from predators. The spray was found to be an effective deterrent against sea birds and a good alternative to the recovery pen, which sea lions had a tendency to disturb.

RECOVERING TAGS FROM 2003 ROE HERRING CATCHES

Tag recovery refers to the collection of tagged fish by searching the catch during the processing of herring roe at fish plants. Tag recovery observations were used to calculate tag recovery rates (%) which were determined by relating the number of tags recovered from specific fisheries to the number of tags released from defined release events. Estimates of tag recovery densities were determined by relating the number of tag recoveries from specific fisheries to quantities of roe herring searched (mt).

In 2003, the QCI region was closed for roe herring harvests, therefore CWT recovery effort focussed on searching a representative portion of catch from the PRD, CC, SG and WCVI. The equipment and methods for tag recovery

were the same as for the 2000 to 2002 seasons, using R9500 CWT detectors and deflector gates along a conveyor belt (Schweigert and Flostrand 2000; Flostrand and Schweigert, 2002 2003). The three fish plants housing the tag recovery equipment in 2003 were also the same as those during the 2001 and 2002 tag recovery seasons, being Icicle Seafoods Inc. (Icicle), Canadian Fishing Company (CFC), and Bella Coola Fisheries Ltd. (Bella Coola). Unlike in previous years, no roe herring seine catch from Sitka, Alaska was searched for tags.

Tag recovery equipment operated from April 7 to July 4 and J.O. Thomas and Associates were again contracted to: operate recovery units; collect and handle samples; record results of equipment operation; verify catch information related to fish lot processing records and communicate processing schedules and equipment needs with plant staff. Roe herring catch records and CWT search data were compiled into a Microsoft Access database, referred to as the Herring Tag Recovery Database (J.O. Thomas and Associates Ltd., 2003). Logbooks were kept to document equipment settings and test trials approximately every hour using seeded specimens to ensure that recovery units were in working order. Records were also kept of conveyor speeds and loading rates (mt/hour). Field personnel removed the gill tissue and rinsed each carcass of a putative tagged fish with water to remove possible sources of metal contamination prior to re-testing for the presence of a tag. This was done to reduce the number of false positive recoveries brought to the laboratory for CWT dissection.

TAG RECOVERIES AND RECOVERY RATES

Observed tag recovery rates were determined as the number of tags recovered divided by the number of tags released. Recovery rates were determined for all 1999 to 2003 release events:

$$RR_o = R_o / T \qquad (1)$$

where

RR_o = observed tag recovery rate;
R_o = observed number of tags recovered by release year, region, and Area and by recovery region, Area and gear;
T = number of tags released by year, region and Area.

Tag (recovery) densities were determined as:

$$RD = R_o / S \qquad (2)$$

where

RD = observed tags recovered per metric tonne of roe herring searched;
S = roe herring catch searched (mt) by region, Area and gear.

TAG REMOVALS AND REMOVAL RATES

Tag removal refers to the estimate of the number of tagged herring removed from the population by roe herring fisheries. Estimates of tag removals from 2003 roe herring fisheries were determined by incorporating the proportion of each roe herring fishery's catch searched for tags into the number of recoveries observed :

$$R' = R_o (C/S) \quad (3)$$

where

R' = estimated number of tags removed;
C = total roe herring catch (mt) by region, Area, and gear.

Tag removal rates were calculated by dividing tag removal estimates by the number of tags released from defined release events; thus each rate can be interpreted as a percentage of the released tags removed by each fishery. Estimates of tag removal rates were determined by:

$$RR' = R' / T = RR_o / (S/C) \quad (4)$$

where

RR' = estimated tag removal rate.

RESULTS

TAGGING AND RELEASING HERRING

There were 28 tagging sessions in 2003 and the total number of Pacific herring tagged and released from March 5 to April 2 was 326,732 (Figures 2 to 4). Of that total, 95,890 were tagged in the SG, comprised of 6,643 from Area 16, 33,147 from the southern part of Area 14 and 56,100 from the northern part of Area 14 (Figure 2). Releases from sets 1 to 6 preceded the seine opening in Area 14 and all SG tagging preceded the gillnet opening in Area 14. In the CC, 119,342 herring were tagged in Areas 7, 8 and 9, comprised of 78,229, 27,453 and 13,660 releases, respectively (Figure 3). Releases from sets 12 to 18 preceded or were concurrent with the seine opening in Area 7 and all CC tagging preceded the gillnet opening in Areas 6 and 7. In the PRD, 111,500 herring were tagged in Areas 4 and 5, comprised of 15,066 and 96,434 releases, respectively (Figure 4). All releases followed gillnet and seine openings in Areas 4 and 5, respectively.

Tagging intervals at the beginning of most tagging sessions were rated good or good-fair and tagging intervals at the end of most sessions (2 to 3 hours after tagging had started) were rated fair-poor, poor or very poor. In total,

96,695 tagged herring were rated as good; 26,636 tagged herring were rated as good-fair; 102,323 were rated as fair; 22,181 were rated as fair-poor; 69,849 were rated as poor and 9,048 were rated as very poor.

RECOVERING TAGS FROM 2003 ROE HERRING CATCHES

The total annual BC catch of roe herring in 2003, including charter vessel payment catches, was 28,797.2 mt (Rusch et al 2003). Roe herring fishery catches and tag recoveries by region, Area, gear, and tonnages searched for tags at fish processing plants are summarized in Table 1. Fishery catch dates, Areas and amounts caught (including charter payment catches) are as follows. Seining in the SG occurred on March 14 to 16 in Area 14 and 10,600.6 mt were caught. Gillnetting in the SG occurred on March 14 to 23 in Areas 14 and 17 and 8,083.2 mt were caught (mostly from Area 14). Seining in the CC occurred on March 23 to 28 in Area 7 and 2,298.8 mt were caught. Gillnetting in the CC occurred on April 2 and 3 in Area 6 and 289.4 mt were caught. Seining in the PRD occurred on March 23 and 25 in Area 5 and 1,446.1 mt were caught. Gillnetting in the PRD occurred on March 27 to 30 in Area 4 and 2,562.8 mt were caught. Seining in the WCVI occurred on March 10 to 14 in Area 23 and March 8 to 10 in Area 25 and 2,073.0 and 498.1 mt were caught, respectively. Gillnetting in the WCVI occurred on March 24 to 27 in Area 25 and 945.3 mt were caught.

An estimated 7172 mt of the total BC roe herring catch was searched for CWTs, representing approximately 24.9% of the total catch. Regionally, 28.5 % of WCVI, 23.7% of SG, 46.4% of CC and 13.4% of PRD catches were searched for CWTs. Search percentages by fishery (by region and gear) are as follows: the SG seine catch search percentage was 24.1%; the SG gillnet was 23.3%; the CC seine was 49.5%; the CC gillnet was 21.3%; the PRD seine was 13.4%; the PRD gillnet was 13.3%; the WCVI seine (Area 23) was 39.8%; the WCVI seine (Area 25) was 27.1% and the WCVI gillnet was 4.2% (Tables 1 to 6). From the total seine catch of 16,916.6 mt, 28.6% was searched for CWTs and from the total gillnet catch of 11,880.7 mt, 19.6% was searched. The tonnages of herring searched at each of the fish plants were approximately 2,359 at Bella Coola, 2,264 at CFC and 2,549 at Icicle. Approximately 74% of the combined BC roe herring product processed at Icicle, CFC and Bella Coola fish plants was searched for tags.

TAG RECOVERIES AND RECOVERY RATES

A total of 1,148 tag recoveries with known release and recovery history were obtained from the 2003 CWT search efforts. There were 333 recoveries from 2003 in-season releases; 524 recoveries from 2002 releases; 179 recoveries from 2001 releases; 94 recoveries from 2000 releases; 6 recoveries from 1999 or 2000 between-year discrepant code releases and 12 recoveries from 1999 releases. Table 1 presents all the recoveries by release year and by region, gear, Area and fish plant of recovery and Table 2 presents all the

recoveries by release year, region, Area and total tags released and by recovery region, Area, gear, catch total and the amount of catch searched for tags. Two tags were lost in the laboratory prior to being read, so their release information is unknown. In addition, 172 herring without tags were recovered from causing false positive tag detection due to metal contamination at the three fish plants (12 CFC, 96 Icicle and 19 Bella Coola).

Out of the 333 in-season recoveries, 39 were caught in the SG and 294 were caught in the CC. All the SG recoveries were gillnetted and all the CC recoveries were seined. There were no inter-regional strays but one Area stray was observed in the SG from Area 16 to Area 14.

Out of the 524 recoveries from one-year at large 2002 releases, 112 were caught in the SG, 263 were caught in the CC, 147 were caught in the PRD and 2 were caught in the WCVI. There were 24 inter-regional strays from 2002 releases and 2 were from Area 14 recovered in Area 23; 2 were from Area 6 recovered in Area 14; 1 was from Area 7 recovered in Area 14; 1 was from Area 8 recovered in Area 14; 3 were from Area 4 recovered in Area 7; 7 were from Area 5-north recovered in Area 7 and 8 were from a Area 5-south (Wilson Inlet) recovered in Area 7. From all the one-year at large recoveries, 393 were seined and 131 were gillnetted. Seventy of those were from SG seine and 42 were from SG gillnet; 256 were from CC seine and 7 were from CC gillnet; 66 were from PRD seine and 82 were from PRD gillnet and the two WCVI recoveries were seined.

Out of the 179 recoveries from two-year at large 2001 releases, 64 were caught in the SG, 10 were caught in the CC, 104 were caught in the PRD and 1 was caught in the WCVI. There were 11 inter-regional strays from 2001 releases and 1 was from Area 14 recovered in Area 23; 1 was from Area 5 recovered in Area 6; 4 were from Area 4 recovered in Area 7 and 5 were from Area 5 recovered in Area 7. From all the two-year at large recoveries, 67 were seined and 112 were gillnetted. Twenty-six of those were from SG seine and 38 were from SG gillnet; 9 were from CC seine and 1 was from CC gillnet; 31 were from PRD seine and 73 from PRD gillnet and the WCVI recovery was seined.

Out of the 94 recoveries from three-year at large 2000 releases, 89 were caught in the SG and 5 were caught in the WCVI. The 5 WCVI recoveries were inter-regional strays, 1 from Area 14 recovered in Area 25; 3 from Area 14 recovered in Area 23 and 1 from Area 17 recovered in Area 23. From all the three-year at large recoveries, 28 were seined and 66 were gillnetted. Twenty-three of those were from SG seine, 66 were from SG gillnet and the 5 WCVI recoveries were seined.

Out of the 12 recoveries from four-year at large 1999 releases, 11 were caught in the SG and 1 was caught in the WCVI. The WCVI recovery was an inter-regional stray from Area 14 recovered from an Area 25 seine event and no

QCI releases were recovered. Out of the 11 SG recoveries, 2 were seined and 9 were gillnetted.

Several of the 2003 recoveries possessed discrepant tag codes from accidental repeated code usage from 1999 and 2000 release events (Flostrand and Schweigert 2002, 2003). There were 6 recoveries with codes having 1999/2000 between-year discrepancies (BYDs), these are included with totals in Tables 1 and 2. In addition, there were 2 recoveries with codes having either 1999 or 2000 within-year discrepancies (WYDs) affecting distinction between Areas 14 and 17 releases. From the 2 recoveries with WYDs, 1 was from a 1999 release and the other was from a 2000 release (Table 2).

Herring CWT recovery rates with respective release and recovery data are presented in Table 3. Only summary rates derived from all fishery sources are described below. For SG in-season recoveries, recovery rates from Areas 14 and 16 were 0.04 and 0.02%, respectively. For CC in-season recoveries, recovery rates were 1.88 and 0.02% for the Area 7, Sub-Areas 3 and 8, respectively. The one-year at large recovery rate for Area 14 releases was 0.13%; rates for Areas 6 to 8 were 0.88, 0.29 and 0.01%, respectively; rates for Areas 4, 5-north and 5-south (Wilson Inlet) were 0.16, 0.29 and 0.12%, respectively. The two-year at large recovery rate for Area 14 releases was 0.11% and the rates for Areas 4 and 5 releases were 0.11 and 0.20%, respectively. The three-year at large recovery rates for Area 14 and 17 releases ranged from 0.02 to 0.05% and the four-year at large rates for Areas 14 and 17 releases were 0.02 and 0.03%. The recovery rate for tags with 1999/2000 BYDs was 0.08%.

Estimates of in-season and inter-annual tag recovery densities are presented in Table 4. Tag densities for in-season recoveries from Areas 14 and 16 releases in Area 14 gillnet catches were 0.020 and 0.001 tags/mt, respectively. Tag densities for in-season recoveries from Area 7 releases in Area 7 seine catches were 0.0256 and 0.002 tags/mt.

Tag densities for one-year at large recoveries from Area 14 releases in Area 14 seine, Area 14 gillnet and Area 23 seine catches were 0.027, 0.021 and 0.002 tags/mt, respectively. Tag densities for one-year at large recoveries from Area 6 releases in Area 7 seine, Area 6 gillnet and Area 14 gillnet catches were 0.133, 0.087 and 0.001 tags/mt , respectively. Tag densities for one-year at large recoveries from Area 7 releases in Area 7 seine, Area 6 gillnet and Area 14 gillnet catches were 0.076, 0.016 and 0.001 tags/mt, respectively. The tag density for a one-year at large recovery from an Area 8 release in an Area 14 seine catch was less than 0.001 tags/mt. Tag densities for one-year at large Area 4 releases in Area 4 gillnet, Area 5 seine and Area 7 seine catches were 0.206, 0.021 and 0.003 tags/mt, respectively. Tag densities for one-year at large Area 5-north releases in Area 4 gillnet, Area 5 seine and Area 7 seine catches were 0.032, 0.291 and 0.006 tags/mt, respectively. Tag densities for one-year at

large Area 5-south (Wilson Inlet) releases in Area 5 seine and Area 7 seine catches were 0.026 and 0.007 tags/mt, respectively.

Tag densities for two-year at large recoveries from Area 14 releases in Area 14 seine, Area 14 gillnet and Area 23 seine catches were 0.010, 0.020 and 0.001 tags/mt, respectively. Tag densities for two-year at large recoveries from Area 4 releases in Area 4 gillnet, Area 5 seine and Area 7 seine catches were 0.177, 0.026 and 0.004 tags/mt, respectively. Tag densities for two-year at large recoveries from Area 5 releases in Area 4 gillnet, Area 5 seine, Area 7 seine and Area 6 gillnet catches were 0.035, 0.135, 0.004 and 0.016 tags/mt, respectively.

Tag densities for three-year at large recoveries from Areas 14 releases in Area 14 seine, Area 14 gillnet, Area 23 seine and Area 25 seine catches were 0.005, 0.024, 0.004 and 0.007 tags/mt, respectively. Tag densities for three-year at large Area 17 releases in Area 14 seine, Area 14 gillnet and Area 23 seine catches were 0.004, 0.010 and 0.001 tags/mt, respectively. The tag density for three-year at large recoveries from Areas 14 and 17 WYDs in Area 14 gillnet catches was 0.001 tags/mt.

Tag densities for four-year at large recoveries from Areas 14 releases in Area 14 seine, Area 14 gillnet and Area 25 seine catches were less than 0.001, 0.003 and 0.007 tags/mt, respectively. Tag densities for four-year at large Area 17 releases in Area 14 seine and Area 14 gillnet catches were less than 0.001 and 0.011 tag/mt, respectively. The tag density for four-year at large recoveries from Areas 14 and 17 WYDs in Area 14 gillnet catches was 0.001 tags/mt.

Tag densities for 1999/2000 BYDs from Areas 14 and 17 releases in Area 14 seine and Area 14 gillnet catches were less than 0.001 and 0.003 tags/mt, respectively.

TAG REMOVALS AND REMOVAL RATES

Estimates of CWT removals and removal rates by Area and year of release and by Area and gear of recovery are presented in Tables 5 and 6. The estimate of the total number of tagged herring removed from the population by the 2003 roe herring fisheries was approximately 4,432 (Table 5). Summary estimates of in-season, one-year, two-year, three-year, four-year and 1999/2000 BYD tag removals were 761, 2126, 1074, 395, 51 and 25, respectively (Table 5). Summary estimates of in-season tag removal rates ranged from 0.03 to 3.80%; summary estimates of one-year at large tag removal rates ranged from 0.04 to 2.01%; summary estimates of two-year at large removal rates ranged from 0.45 to 1.34%; summary estimates of three-year at large removal rates ranged from 0.06 to 0.21%; summary estimates of four-year at large removal rates ranged from 0.07 to 0.15% and the summary estimate for the BYD tag removal rate was 0.35%.

DISCUSSION

In 2003, the total of 326,732 Pacific herring tagged and released with CWTs by 4 tag injectors during 28 sessions was greater than any other season to date. In addition, there was relatively wide geographic coverage in the three target herring stock assessment regions and tagging in Areas prior to roe herring fisheries was minimized. Although we had hoped to tag more fish in Areas 3 and 4 of the PRD, opportunities were limited by weather, the presence of the gillnet fishery and difficulties locating and catching fish.

The mean tagging session duration in 2003 was 2.9 hours, compared with 2.0 hours in 2002. One of the reasons why some of the sessions were longer in 2003 was because all the sets were caught by the tagging vessel. In past years, other charter vessels have caught fish for some of the tagging sessions when schools of herring were too deep to be caught using the relatively shallow seine nets aboard the tagging vessels. Transferring fish to a tagging vessel reduces the efficiency of tagging operations and puts limits on the number of fish able to be tagged in a session. Furthermore, net transfers cause additional stress and disturbance to the fish, such as seen by scale loss and changes in quality of fish slime. Another reason why some of the tagging sessions were longer in 2003 was due to the incorporation of unique tag codes to differentiate time intervals within each tagging session. Differentiating tagging intervals enables potential differences in recovery rates between intervals to be observed, which should provide information towards maximizing tagging opportunities. Effects from fishing, environmental conditions and biological characteristics of fish schools affect the physical condition of herring collected for tagging and variability in quality of fish being tagged can occur between or during tagging sessions. Specific factors contributing to the variability include fish density and disturbance in the purse seine; length of containment time prior to tagging; sea state; temperature; fish size and age and reproductive state.

In 2003, there were opportunities to search roe herring for CWTs from all the regions where commercial fisheries took place. The 7172 mt of BC roe herring searched was comparable to totals from 2000 to 2002 recovery years (Flostrand and Schweigert 2002, 2003). Unfortunately in 2003, the PRD catches were relatively under-represented with tag search coverage at approximately 13%. On the other hand, the 46.4% CC search coverage was particularly high due to the high search coverage of the seine fishery (49.5%). Variation in tag search coverage by region and gear occurs because different fisheries have different quotas and also because sources of roe herring for the three fish plants housing tag recovery equipment are not determined prior to the season. Currently, options are being investigated to possibly relocate the Icicle CWT recovery unit to a different fish plant to improve tag search coverage, especially of northern stocks (PRD and QCI in particular). Unfortunately, this is a complex process because much of the catch from northern stocks goes to many different fish plants including those located in Prince Rupert.

The 815 inter-annual tag recoveries in 2003 are the most obtained to date from a single recovery year, indicating cumulative effects from several years of tagging. The 2003 recoveries also demonstrated considerable reproductive straying, as evidenced by the 41 regional strays and 196 Area strays. The number of inter-annual tag recoveries can be expected to increase each year tagging continues, especially following seasons with relatively high tagging coverage such as those of recent years.

Of all the 2003 roe herring caught, an estimated 2,327.0 mt (9.6%) of the gillnet catch was searched and an estimated 4,844.9 mt (28.6%) of the seine catch was searched. The search quantities and catch proportions by gear are either within the ranges or similar to results from 2000 to 2002 tag recovery years, which for gillnet ranged from 1,880.0 to 3,728.5 mt (15.2 to 33.3%) and for seine ranged from 4,465.0 to 4,740.0 mt (26.5 to 30.8%; Appendices D and E; Flostrand and Schweigert 2002, 2003). Furthermore, the majority of two-year at large and longer recoveries resulted from gillnet catches in 2001 and 2002 as was observed in 2003, despite the lower amounts and proportions of gillnet catch searched compared with seine catch. These higher proportions of gillnet-caught inter-annual recoveries are consistent with expected effects of gillnet size-selectivity on larger (and older) fish (Flostrand and Schweigert 2003; Schweigert 2004)

Estimates of recovery rates and tag densities are helpful in considering fishery effects and reproductive straying in the context of population dynamics. The formats for summarising CWT results in Tables 1 to 6 follow the formats presented in Flostrand and Schweigert (2003); whereby summary release and recovery data are resolved to Areas within herring stock assessment regions and recoveries are distinguished by gear type. Results from 2000 and 2001 CWT search efforts are also presented in this format in Appendices D and E. There is considerable variation among tag recovery rates and recovery densities within and between recovery years. As mentioned in Flostrand and Schweigert (2003), sources of variation can be attributed to many effects. Currently, a simulation model is being developed with Pacific herring tagging data to assess the impacts of various factors on the expected recovery rates of CWT herring.

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Table 1. Summary of roe herring fishery catches (metric tonnes) and CWT recoveries from Canadian Fishing Company Ltd (CFC), Icicle Seafoods Inc (Icicle) and Bella Coola Fisheries Ltd (Bella Coola) fish plants in 2003.

Region	Gear	Area(s)	Plant of Recovery	Tonnage Caught (mt)	Tonnage Searched (mt)	% Catch Searched	CWT Recoveries by Release Year						
							1999	BYD	2000	2001	2002	2003	All
WCVI	SN	23	Bella Coola	-	355.6	-	-	-	1	-	-	-	1
	SN	23	CFC	-	76.2	-	-	-	1	-	1	-	2
	SN	23	Icicle	-	393.7	-	-	-	2	1	1	-	4
	SN	23	All	2,073.0	825.5	39.8	-	-	4	1	2	-	7
	SN	25	Bella Coola	498.1	135.2	27.1	1	-	1	-	-	-	2
	GN	25	Bella Coola	-	39.9	-	-	-	-	-	-	-	-
	GN	25	CFC	-	0.0	-	-	-	-	-	-	-	-
	GN	25	Icicle	-	0.0	-	-	-	-	-	-	-	-
	GN	25	All	945.3	39.9	4.2	-	-	-	-	-	-	-
	Both	23, 25	All	3,516.3	1,000.6	28.5	1	-	5	1	2	-	9
SG	SN	14	Bella Coola	-	806.0	-	1	-	11	14	19	-	45
	SN	14	CFC	-	631.0	-		-	7	4	19	-	30
	SN	14	Icicle	-	1,116.3	-	1	1	5	8	32	-	47
	SN	14	All	10,600.6	2,553.3	24.1	2	1	23	26	70	-	122
	GN	14, 17	Bella Coola	-	248.6	-	1	2	10	5	4	1	23
	GN	14, 17	CFC	-	1,228.3	-	5	2	42	24	32	31	136
	GN	14, 17	Icicle	-	404.6	-	3	1	14	9	6	7	40
	GN	14, 17	All	8,083.2	1,881.5	23.3	9	5	66	38	42	39	199
	Both	14, 17	All	18,683.8	4,434.8	23.7	11	6	89	64	112	39	321
CC	SN	7	Bella Coola	-	523.5	-	-	-	-	5	110	294	409
	SN	7	CFC	-	186.9	-	-	-	-	1	50	-	51
	SN	7	Icicle	-	428.2	-	-	-	-	3	96	-	99
	SN	7	All	2,298.8	1,138.5	49.5	-	-	-	9	256	294	559

Table 1 (continued).

Region	Gear	Area(s)	Plant of Recovery	Tonnage Caught (mt)	Tonnage Searched (mt)	% Catch Searched	CWT Recoveries by Release Year						
							1999	BYD	2000	2001	2002	2003	All
CC	GN	6	Bella Coola	-	0.0	-	-	-	-	-	-	-	-
	GN	6	CFC	-	61.7	-	-	-	-	1	7	-	8
	GN	6	Icicle	-	0.0	-	-	-	-	-	-	-	-
	GN	6	All	289.4	61.7	21.3	-	-	-	1	7	-	8
	Both	6, 7	All	2,588.2	1,200.2	46.4	-	-	-	10	263	294	567
PRD	SN	5	Bella Coola	-	101.6	-	-	-	-	21	36	-	57
	SN	5	CFC	-	79.8	-	-	-	-	9	25	-	34
	SN	5	Icicle	-	10.9	-	-	-	-	1	4	-	5
	SN	5	All	1,446.1	192.3	13.3	-	-	-	31	65	-	96
	GN	4	Bella Coola	-	148.8	-	-	-	-	27	45	-	72
	GN	4	CFC	-	0.0	-	-	-	-	-	-	-	-
	GN	4	Icicle	-	195.0	-	-	-	-	46	37	-	83
	GN	4	All	2,562.8	343.8	13.4	-	-	-	73	82	-	155
	Both	4, 5	All	4,008.9	536.2	13.4	-	-	-	104	147	-	251
Recoveries by plant			Bella Coola	-	2,359.2	-	3	2	23	72	214	295	609
			CFC	-	2,263.9	-	5	2	50	39	134	31	261
			Icicle	-	2,548.8	-	4	2	21	68	176	7	278
BC	SN	All	All	16,916.6	4,844.9	28.6	3	1	28	67	393	294	786
	GN	All	All	11,880.7	2,327.0	19.6	9	5	66	112	131	39	362
	Both	All	All	28,797.2	7,172.0	24.9	12	6	94	179	524	333	1,148

Most SG gillnet catches were taken from Area 14 but an estimated 239 mt were taken from Area 17, none of which were searched for CWTs. Seine catch from Area 25 was taken for test fishing charter payment. All other test fishing charter catches are summed with commercial catches.

Table 2. Summary of 2003 CWT recoveries by assessment region, Area and fishing gear relative to releases. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery 2003	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	Total
	Area			4	5	7	6	14	14,17	23	25	25	
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN	
	Total Catch (mt)			2,562.8	1,446.1	2,298.8	289.4	10,600.6	8,083.2	2,073.0	498.1	945.3	28,797.2
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9	7,172.0
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2	24.9
Release Year	Region	Area (Sub)	Tags Released										
1999	QCI	2E	6,175	-	-	-	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	1	6	-	1	-	8
	SG	17	14,266	-	-	-	-	1	2	-	-	-	3
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	1	-	-	-	1
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	1	5	-	-	-	6
2000	SG	14	180,229	-	-	-	-	13	46	3	1	-	63
	SG	17	58,994	-	-	-	-	10	19	1	-	-	30
2000 WYD	SG	14 or 17	6,471	-	-	-	-	-	1	-	-	-	1
2001	PRD	4	65,809	61	5	4	-	-	-	-	-	-	70
	PRD	5	22,387	12	26	5	1	-	-	-	-	-	44
	SG	14	60,558	-	-	-	-	26	38	1	-	-	65
2002	PRD	4	48,960	71	4	3	-	-	-	-	-	-	78
	PRD	5 north	25,701	11	56	7	-	-	-	-	-	-	74
	PRD	5 south, WI	11,081	-	5	8	-	-	-	-	-	-	13
	CC	6	18,168	-	-	151	6	-	2	-	-	-	159
	CC	7	31,027	-	-	87	1	-	1	-	-	-	89
	CC	8	9,463	-	-	-	-	1	-	-	-	-	1
	SG	14	83,528	-	-	-	-	69	39	2	-	-	110

Table 2 (continued).

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	Total
	Area			4	5	7	6	14	14,17	23	25	25	
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN	
	Total Catch (mt)			2,562.8	1,446.1	2,298.8	289.4	10,600.6	8,083.2	2,073.0	498.1	945.3	28,797.2
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9	7,172.0
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2	24.9
Release Year	Region	Area (Sub)	Tags Released										
2003	PRD	4	15,066	-	-	-	-	-	-	-	-	-	-
	PRD	5	96,434	-	-	-	-	-	-	-	-	-	-
	CC	7 (3)	15,519	-	-	292	-	-	-	-	-	-	292
	CC	7 (8)	11,739	-	-	2	-	-	-	-	-	-	2
	CC	7 (13,14,22,27)	50,971	-	-	-	-	-	-	-	-	-	-
	CC	8	27,453	-	-	-	-	-	-	-	-	-	-
	CC	9	13,660	-	-	-	-	-	-	-	-	-	-
	SG	14	89,247	-	-	-	-	-	38	-	-	-	38
	SG	16	6,643	-	-	-	-	-	1	-	-	-	1
All	All		1,005,692	155	96	559	8	122	199	7	2	-	1,148

Most SG gillnet catches were taken from Area 14 but an estimated 239 mt were taken from Area 17, none of which were searched for CWTs.
Sub-Areas of Area 7 2003 releases in parentheses.
WI refers to Wilson Inlet release event (southern PRD).

Table 3. Estimates of 2003 CWT recovery rates (percentage of the released tags recovered) by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	Total
	Area			4	5	7	6	14	14,17	23	25	25	
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN	
	Total Catch (mt)			2,562.8	1,446.1	2,298.8	289.4	10,600.6	8,083.2	2,073.0	498.1	945.3	28,797.2
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9	7,172.0
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2	24.9
Release Year	Region	Area (Sub)	Tags Released										
1999	QCI	2E	6,175	-	-	-	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	<0.01	0.03	-	<0.01	-	0.03
	SG	17	14,266	-	-	-	-	0.01	0.01	-	-	-	0.02
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	0.02	-	-	-	0.02
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	0.01	0.07	-	-	-	0.08
2000	SG	14	180,229	-	-	-	-	0.01	0.03	<0.01	<0.01	-	0.03
	SG	17	58,994	-	-	-	-	0.02	0.03	<0.01	-	-	0.05
2000 WYD	SG	14 or 17	6,471	-	-	-	-	-	0.02	-	-	-	0.02
2001	PRD	4	65,809	0.09	0.01	0.01	-	-	-	-	-	-	0.11
	PRD	5	22,387	0.05	0.12	0.02	<0.01	-	-	-	-	-	0.20
	SG	14	60,558	-	-	-	-	0.04	0.06	<0.01	-	-	0.11
2002	PRD	4	48,960	0.15	0.01	0.01	-	-	-	-	-	-	0.16
	PRD	5 north	25,701	0.04	0.22	0.03	-	-	-	-	-	-	0.29
	PRD	5 south, WI	11,081	-	0.05	0.07	-	-	-	-	-	-	0.12
	CC	6	18,168	-	-	0.83	0.03	-	0.01	-	-	-	0.88
	CC	7	31,027	-	-	0.28	<0.01	-	<0.01	-	-	-	0.29
	CC	8	9,463	-	-	-	-	0.01	-	-	-	-	0.01
	SG	14	83,528	-	-	-	-	0.08	0.05	<0.01	-	-	0.13

Table 3 (continued).

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	Total
	Area			4	5	7	6	14	14,17	23	25	25	
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN	
	Total Catch (mt)			2,562.8	1,446.1	2,298.8	289.4	10,600.6	8,083.2	2,073.0	498.1	945.3	28,797.2
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9	7,172.0
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2	24.9
Release			Tags										
Year	Region	Area (Sub)	Released										
2003	PRD	4	15,066	-	-	-	-	-	-	-	-	-	-
	PRD	5	96,434	-	-	-	-	-	-	-	-	-	-
	CC	7 (3)	15,519	-	-	1.88	-	-	-	-	-	-	1.88
	CC	7 (8)	11,739	-	-	0.02	-	-	-	-	-	-	0.02
	CC	7 (13,14,22,27)	50,971	-	-	-	-	-	-	-	-	-	-
	CC	8	27,453	-	-	-	-	-	-	-	-	-	-
	CC	9	13,660	-	-	-	-	-	-	-	-	-	-
	SG	14	89,247	-	-	-	-	-	0.04	-	-	-	0.04
	SG	16	6,643	-	-	-	-	-	0.02	-	-	-	0.02

Most SG gillnet catches were taken from Area 14 but an estimated 239 mt were taken from Area 17, none of which were searched for CWTs.
Sub-Areas of Area 7 2003 releases in parentheses.
WI refers to Wilson Inlet release event (southern PRD).

Table 4. Estimates of 2003 tag densities (CWTs recovered per tonne of roe herring searched) by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI
	Area			4	5	7	6	14	14,17	23	25	25
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN
	Total Catch (mt)			2562.8	1446.1	2298.8	289.4	10600.6	8083.2	2073.0	498.1	945.3
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2
Release			Tags									
Year	Region	Area (Sub)	Released									
1999	QCI	2E	6,175	-	-	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	<0.001	0.003	-	0.007	-
	SG	17	14,266	-	-	-	-	<0.001	0.001	-	-	-
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	0.001	-	-	-
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	<0.001	0.003	-	-	-
2000	SG	14	180,229	-	-	-	-	0.005	0.024	0.004	0.007	-
	SG	17	58,994	-	-	-	-	0.004	0.010	0.001	-	-
2000 WYD	SG	14 or 17	6,471	-	-	-	-	-	0.001	-	-	-
2001	PRD	4	65,809	0.177	0.026	0.004	-	-	-	-	-	-
	PRD	5	22,387	0.035	0.135	0.004	0.016	-	-	-	-	-
	SG	14	60,558	-	-	-	-	0.010	0.020	0.001	-	-
2002	PRD	4	48,960	0.206	0.021	0.003	-	-	-	-	-	-
	PRD	5 north	25,701	0.032	0.291	0.006	-	-	-	-	-	-
	PRD	5 south, WI	11,081	-	0.026	0.007	-	-	-	-	-	-
	CC	6	18,168	-	-	0.133	0.097	-	0.001	-	-	-
	CC	7	31,027	-	-	0.076	0.016	-	0.001	-	-	-
	CC	8	9,463	-	-	-	-	<0.001	-	-	-	-
	SG	14	83,528	-	-	-	-	0.027	0.021	0.002	-	-

Table 4 (continued).

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI
	Area			4	5	7	6	14	14,17	23	25	25
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN
	Total Catch (mt)			2562.8	1446.1	2298.8	289.4	10600.6	8083.2	2073.0	498.1	945.3
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2
Release Year	Region	Area (Sub)	Tags Released									
2003	PRD	4	15,066	-	-	-	-	-	-	-	-	-
	PRD	5	96,434	-	-	-	-	-	-	-	-	-
	CC	7 (3)	15,519	-	-	0.256	-	-	-	-	-	-
	CC	7 (8)	11,739	-	-	0.002	-	-	-	-	-	-
	CC	7 (13,14,22,27)	50,971	-	-	-	-	-	-	-	-	-
	CC	8	27,453	-	-	-	-	-	-	-	-	-
	CC	9	13,660	-	-	-	-	-	-	-	-	-
	SG	14	89,247	-	-	-	-	-	0.020	-	-	-
	SG	16	6,643	-	-	-	-	-	0.001	-	-	-
All	All		1,005,692	0.451	0.499	0.491	0.130	0.048	0.106	0.009	0.015	-

Most SG gillnet catches were taken from Area 14 but an estimated 239 mt were taken from Area 17, none of which were searched for CWTs.
Sub-Areas of Area 7 2003 releases in parentheses.
WI refers to Wilson Inlet release event (southern PRD).

Table 5. Estimates of 2003 CWT removals by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	Total
	Area			4	5	7	6	14	14,17	23	25	25	
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN	
	Total Catch (mt)			2,562.8	1,446.1	2,298.8	289.4	10,600.6	8,083.2	2,073.0	498.1	945.3	28,797.2
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9	7,172.0
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2	24.9
Release Year	Region	Area (Sub)	Tags Released										
1999	QCI	2E	6,175	-	-	-	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	4	26	-	4	-	34
	SG	17	14,266	-	-	-	-	4	9	-	-	-	13
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	4	-	-	-	4
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	4	21	-	-	-	25
													-
2000	SG	14	180,229	-	-	-	-	54	198	8	4	-	264
	SG	17	58,994	-	-	-	-	42	82	3	-	-	127
2000 WYD	SG	14 or 17	6,471	-	-	-	-	-	4	-	-	-	4
2001	PRD	4	65,809	455	38	8	-	-	-	-	-	-	501
	PRD	5	22,387	89	195	10	5	-	-	-	-	-	299
	SG	14	60,558	-	-	-	-	108	163	3	-	-	274
2002	PRD	4	48,960	529	30	6	-	-	-	-	-	-	565
	PRD	5 north	25,701	82	421	14	-	-	-	-	-	-	517
	PRD	5 south, WI	11,081	-	38	16	-	-	-	-	-	-	54
	CC	6	18,168	-	-	305	28	-	9	-	-	-	342
	CC	7	31,027	-	-	176	5	-	4	-	-	-	185
	CC	8	9,463	-	-	-	-	4	-	-	-	-	4
	SG	14	83,528	-	-	-	-	286	168	5	-	-	459

Table 5 (continued).

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	Total
	Area			4	5	7	6	14	14,17	23	25	25	
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN	
	Total Catch (mt)			2,562.8	1,446.1	2,298.8	289.4	10,600.6	8,083.2	2,073.0	498.1	945.3	28,797.2
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9	7,172.0
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2	24.9
Release Year	Region	Area (Sub)	Tags Released										
2003	PRD	4	15,066	-	-	-	-	-	-	-	-	-	-
	PRD	5	96,434	-	-	-	-	-	-	-	-	-	-
	CC	7 (3)	15,519	-	-	590	-	-	-	-	-	-	590
	CC	7 (8)	11,739	-	-	4	-	-	-	-	-	-	4
	CC	7 (13,14,22,27)	50,971	-	-	-	-	-	-	-	-	-	-
	CC	8	27,453	-	-	-	-	-	-	-	-	-	-
	CC	9	13,660	-	-	-	-	-	-	-	-	-	-
	SG	14	89,247	-	-	-	-	-	163	-	-	-	163
	SG	16	6,643	-	-	-	-	-	4	-	-	-	4
All	All		1,005,692	1,155	722	1,129	38	506	855	19	8	-	4,432

Most SG gillnet catches were taken from Area 14 but an estimated 239 mt were taken from Area 17, none of which were searched for CWTs.
Sub-Areas of Area 7 2003 releases in parentheses.
WI refers to Wilson Inlet release event (southern PRD).

Table 6. Estimates of 2003 CWT removal rates (percentage of the released tags removed) from all roe herring catches by assessment region, Area and fishing gear. Total catch, catch tonnage and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	Total
	Area			4	5	7	6	14	14,17	23	25	25	
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN	
	Total Catch (mt)			2,562.8	1,446.1	2,298.8	289.4	10,600.6	8,083.2	2,073.0	498.1	945.3	28,797.2
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9	7,172.0
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2	24.9
Release Year	Region	Area (Sub)	Tags Released										
1999	QCI	2E	6,175	-	-	-	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	0.02	0.11	-	0.02	-	0.15
	SG	17	14,266	-	-	-	-	0.03	0.06	-	-	-	0.09
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	0.07	-	-	-	0.07
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	0.06	0.29	-	-	-	0.35
2000	SG	14	180,229	-	-	-	-	0.03	0.11	<0.01	<0.01	-	0.14
	SG	17	58,994	-	-	-	-	0.07	0.14	<0.01	-	-	0.21
2000 WYD	SG	14 or 17	6,471	-	-	-	-	-	0.06	-	-	-	0.06
2001	PRD	4	65,809	0.69	0.06	0.01	-	-	-	-	-	-	0.76
	PRD	5	22,387	0.40	0.87	0.04	0.02	-	-	-	-	-	1.34
	SG	14	60,558	-	-	-	-	0.18	0.27	<0.01	-	-	0.45
2002	PRD	4	48,960	1.08	0.06	0.01	-	-	-	-	-	-	1.15
	PRD	5 north	25,701	0.32	1.64	0.05	-	-	-	-	-	-	2.01
	PRD	5 south, WI	11,081	-	0.34	0.14	-	-	-	-	-	-	0.49
	CC	6	18,168	-	-	1.68	0.15	-	0.05	-	-	-	1.88
	CC	7	31,027	-	-	0.57	0.02	-	0.01	-	-	-	0.60
	CC	8	9,463	-	-	-	-	0.04	-	-	-	-	0.04
	SG	14	83,528	-	-	-	-	0.34	0.20	<0.01	-	-	0.54

Table 6 (continued).

Recovery	Region			PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	Total
	Area			4	5	7	6	14	14,17	23	25	25	
	Gear			GN	SN	SN	GN	SN	GN	SN	SNT	GN	
	Total Catch (mt)			2,562.8	1,446.1	2,298.8	289.4	10,600.6	8,083.2	2,073.0	498.1	945.3	28,797.2
	Tonnage Searched (mt)			343.8	192.3	1,138.5	61.7	2,553.8	1,881.5	825.6	135.2	39.9	7,172.0
	Catch searched (%)			13.4	13.3	49.5	21.3	24.1	23.3	39.8	27.1	4.2	24.9
Release Year	Region	Area (Sub)	Tags Released										
2003	PRD	4	15,066	-	-	-	-	-	-	-	-	-	-
	PRD	5	96,434	-	-	-	-	-	-	-	-	-	-
	CC	7 (3)	15,519	-	-	3.80	-	-	-	-	-	-	3.80
	CC	7 (8)	11,739	-	-	0.03	-	-	-	-	-	-	0.03
	CC	7 (13,14,22,27)	50,971	-	-	-	-	-	-	-	-	-	-
	CC	8	27,453	-	-	-	-	-	-	-	-	-	-
	CC	9	13,660	-	-	-	-	-	-	-	-	-	-
	SG	14	89,247	-	-	-	-	-	0.18	-	-	-	0.18
	SG	16	6,643	-	-	-	-	-	0.06	-	-	-	0.06

Most SG gillnet catches were taken from Area 14 but an estimated 239 mt were taken from Area 17, none of which were searched for CWTs.
Sub-Areas of Area 7 2003 releases in parentheses.
WI refers to Wilson Inlet release event (southern PRD).

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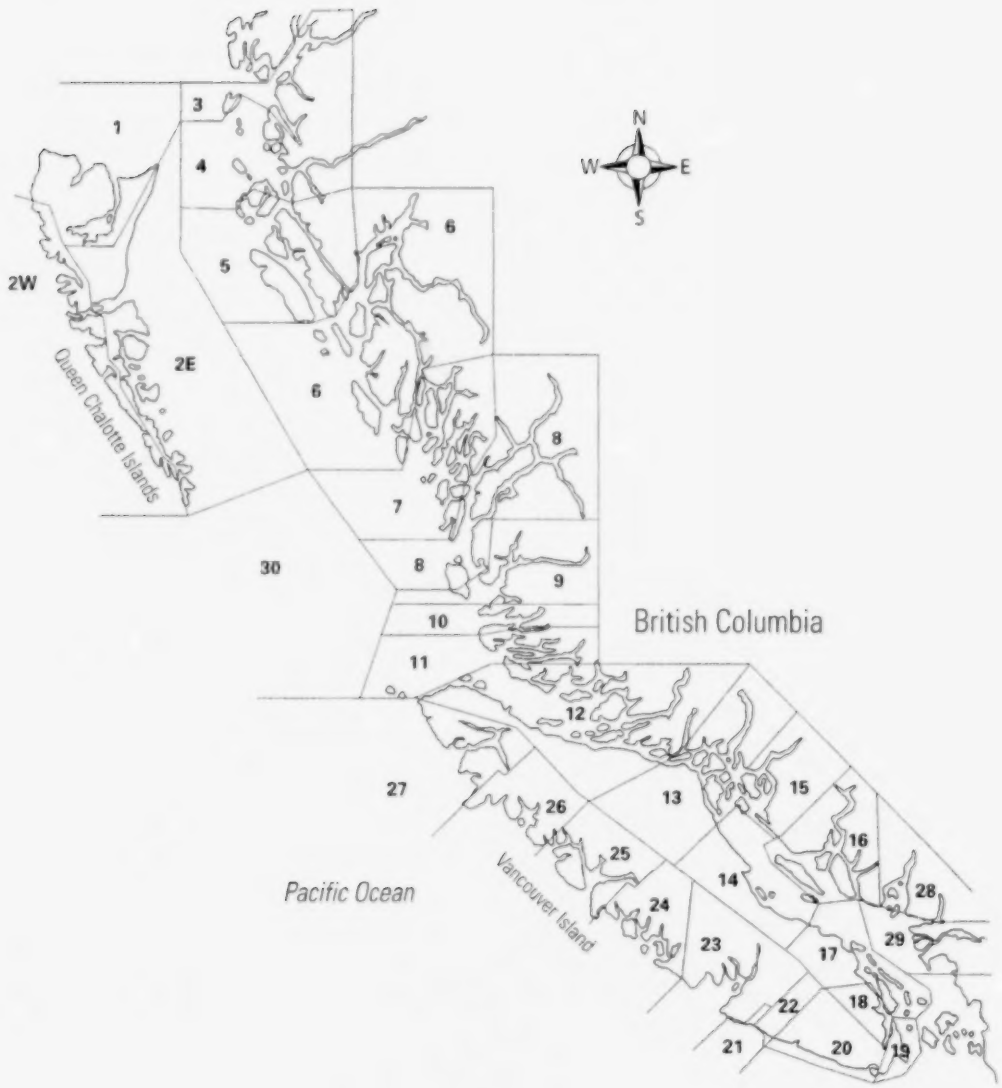

Figure 1. The coast of British Columbia, shown divided into representative inshore fisheries Management (Statistical) Areas.

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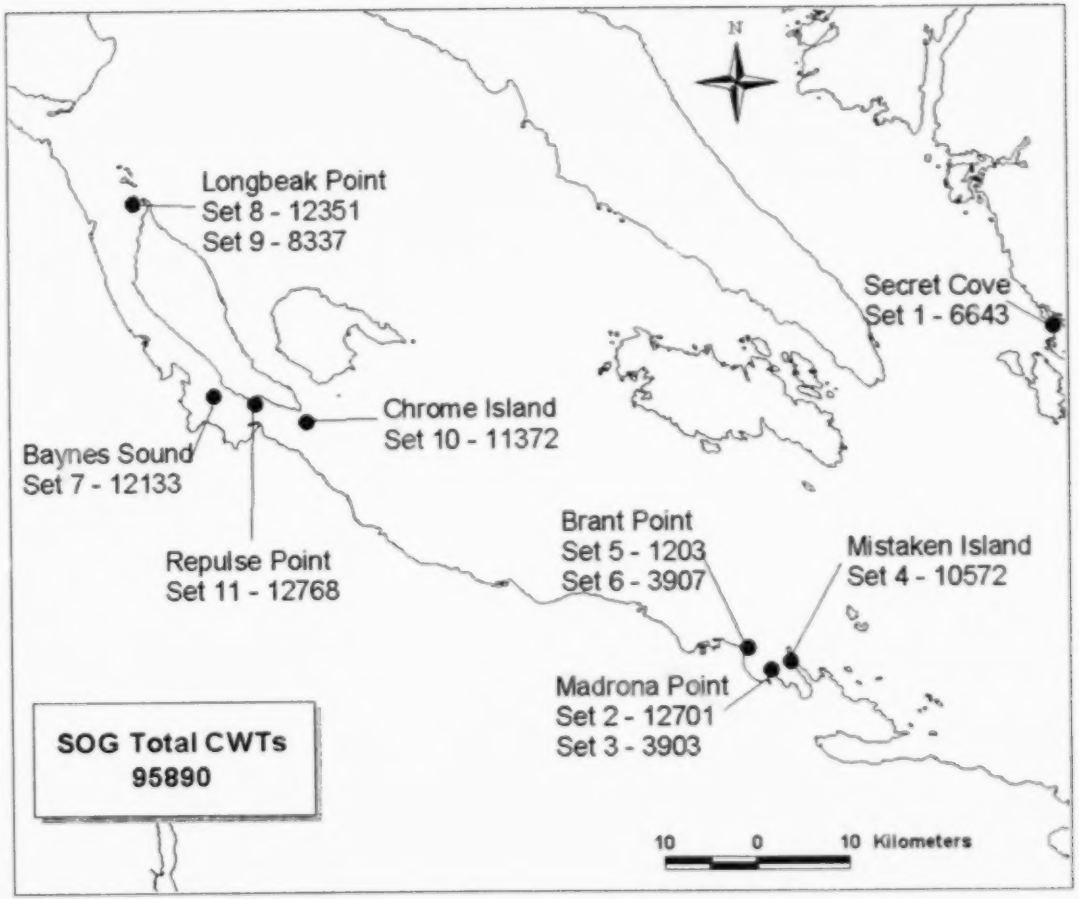

Figure 2. Tag releases by location and set number in the Strait of Georgia in 2003.

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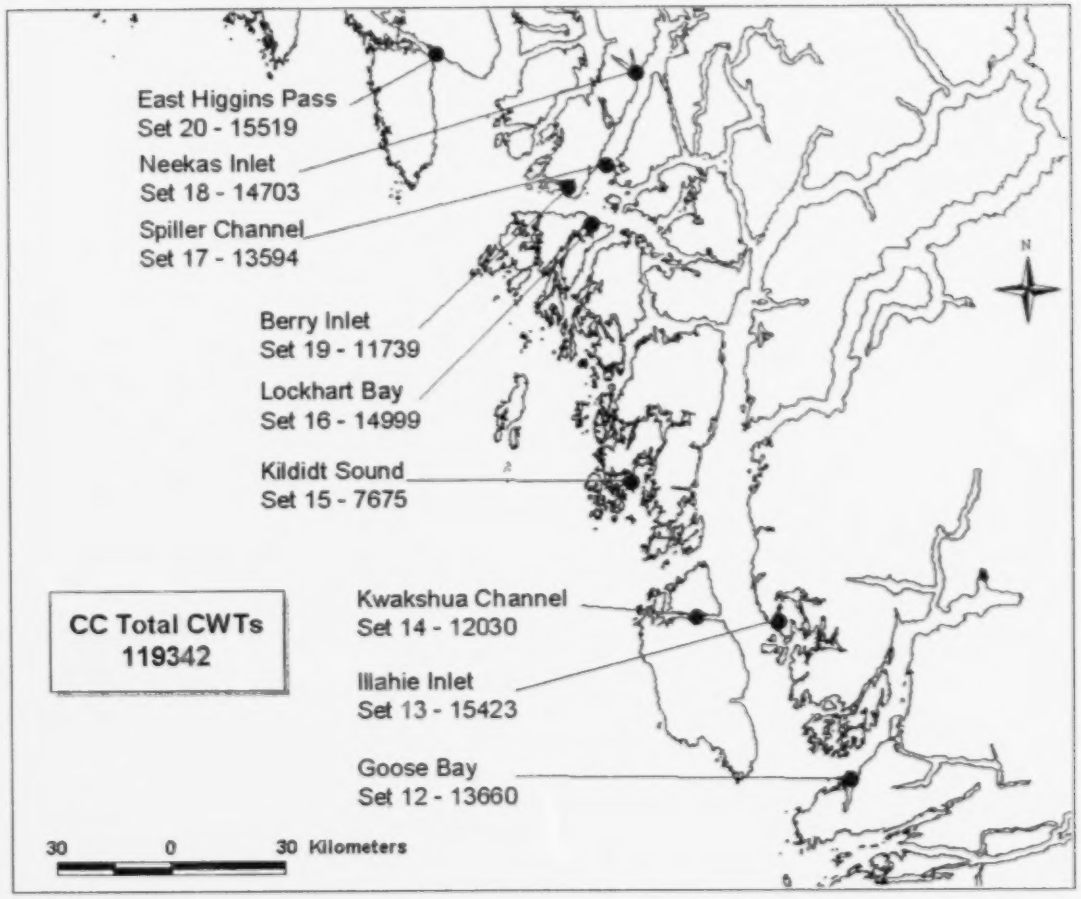

Figure 3. Tag releases by location and set number in the Central Coast in 2003.

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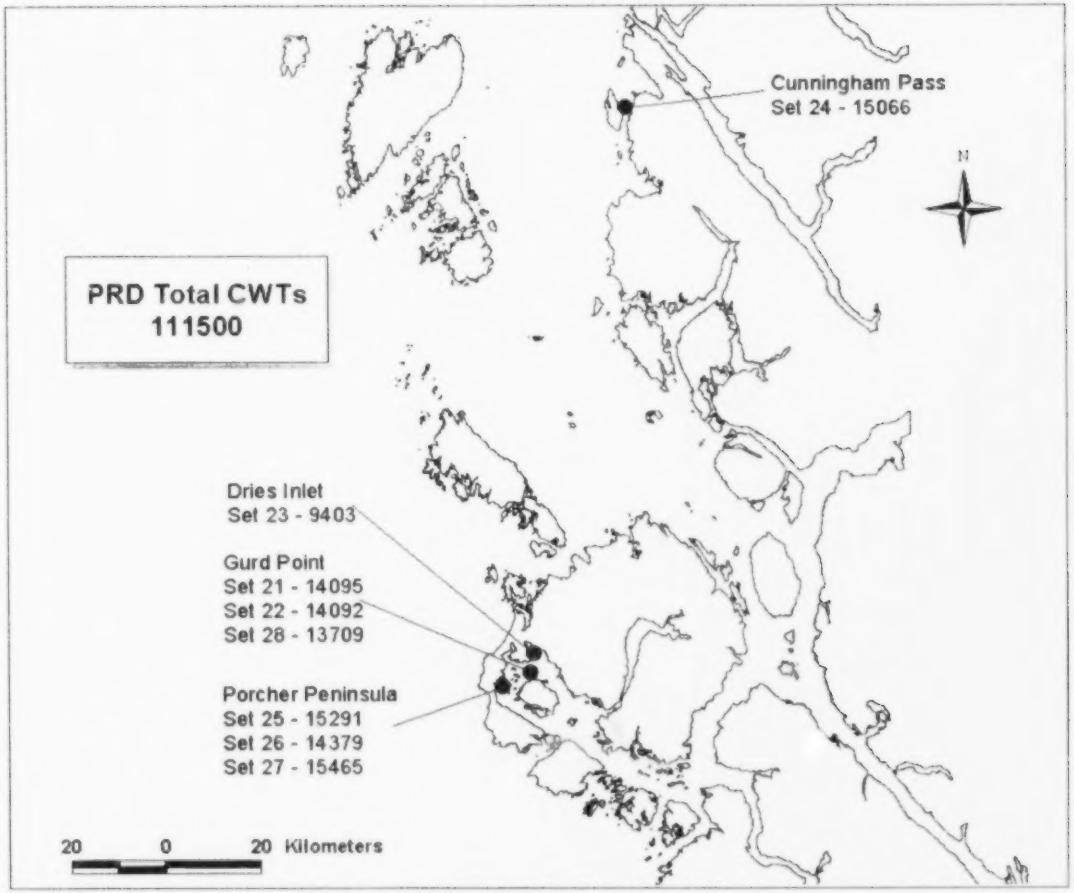

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Figure 4. Tag releases by location and set number in the Prince Rupert District in 2003.

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Appendix A. Summary of fishing information related to herring tagging sessions conducted in 2003.

Location	Area	Date	Set	Latitude		Longitude		PST	Hours	Conditions	Spawning Activity	Predation
Strait of Georgia												
Secret Cove	16	5-Mar-03	1	49	32.15	123	59.55	19:20	1.8	cool, chop	small spot spawns	no sign
Madrona Pt	14	7-Mar-03	2	49	19.15	124	14.26	11:45	3.3	cold, chop	peak March 23	gulls, sea lions
Madrona Pt	14	7-Mar-03	3	49	19.14	124	14.13	17:23	1.1	cold, chop	peak March 23	gulls
Mistaken Is	14	10-Mar-03	4	49	19.48	124	13.43	13:40	2.8	cool, chop	peak March 23	gulls
Brant Pt	14	11-Mar-03	5	49	20.03	124	15.76	7:30	0.3	mild, calm	peak March 23	gulls
Brant Pt	14	11-Mar-03	6	49	19.82	124	14.58	10:10	1.0	mild, calm	peak March 23	gulls
Baynes Snd	14	16-Mar-03	7	49	31.06	124	47.86	6:35	3.0	mild, chop	peak March 12 -23	gulls, sea lions
Longbeak Pt	14	16-Mar-03	8	49	36.44	124	50.88	11:50	3.0	mild, chop	peak March 12 -23	gulls
Longbeak Pt	14	16-Mar-03	9	49	36.54	124	50.95	17:15	2.3	mild, calm	peak March 12 -23	gulls, sea lions
Chrome Is	14	17-Mar-03	10	49	28.21	124	41.16	9:40	2.0	mild, swell	peak March 12 -23	gulls
Repulse Pt	14	17-Mar-03	11	49	29.74	124	42.72	16:30	3.0	mild, calm	peak March 12 -23	no sign
Central Coast												
Goose Bay	9	20-Mar-03	12	51	23.80	127	39.50	7:10	3.5	mild, calm	peak April 2	gulls
Illahie Inlet	9	20-Mar-03	13	51	39.33	127	49.78	14:35	3.8	cool, calm	peak March 28	gulls
Kwakshua Channel	8	21-Mar-03	14	51	39.29	128	6.04	10:25	3.3	cool, chop	Kwakume March 26	no sign
Kildidt Sound	7	22-Mar-03	15	51	52.52	128	7.84	5:30	2.3	cold, calm	peak April 1	no sign
Lockhart Bay	7	23-Mar-03	16	52	12.66	128	15.58	5:30	4.0	cold, calm	in vicinity April 11-14	no sign
Spiller Channel	7	23-Mar-03	17	52	22.45	128	10.89	12:52	3.5	mild, chop	peak March 31	no sign
Neekas Inlet	7	24-Mar-03	18	52	26.72	128	9.84	5:45	3.8	cold, calm	peak April 4	no sign
Berry Inlet	7	24-Mar-03	19	52	16.34	128	19.01	13:30	3.0	cool, calm	peak April 14	no sign
East Higgins Pass	7	25-Mar-03	20	52	29.11	128	40.68	18:40	3.7	mild, calm	peak March 27	no sign
Prince Rupert District												
Gurd Pt	5	27-Mar-03	21	53	55.66	130	37.85	5:45	3.5	cool, chop	peak April 3	gulls
Gurd Pt	5	27-Mar-03	22	53	54.67	130	39.11	12:35	3.5	cool, calm	peak April 3	gulls
Dries Inlet	5	27-Mar-03	23	53	55.86	130	38.35	17:55	2.0	cool, calm	peak April 3	gulls
Cunningham Pass	4	31-Mar-03	24	54	32.32	130	26.94	9:15	3.5	cold, calm	peak April 7	no sign
Porcher Peninsula	5	1-Apr-03	25	53	53.16	130	40.59	11:40	3.5	cold, chop	peak April 2	no sign
Porcher Peninsula	5	1-Apr-03	26	53	53.54	130	40.78	17:10	3.3	cool, chop	peak April 2	no sign
Porcher Peninsula	5	2-Apr-03	27	53	53.32	130	40.67	6:40	3.5	cold, chop	peak April 2	no sign
Gurd Pt	5	2-Apr-03	28	53	55.62	130	38.21	12:05	3.3	cool, chop	peak April 3	no sign

Appendix B. Summary of 1999 and 2000 herring releases and recoveries detailing binary tag code discrepancies.

Discrepancy Type	Release Year	Tagging Set	Area (- sub)	Tag Code	Tags Released	Recoveries in 2003
Within-year[a]	1999	13	14	18-12-13	3,310	1
	1999	12	17	18-12-32	2,505	0
	2000	5	14	02-13-12	3,017	0
	2000	25	17	18-14-43	3,454	1
	2000	14, 15	14	18-12-19	2,506	0
	2000	21	14	02-12-12	9,108	4
	2000	11	14	18-03-34	6,356	1
	2000	16, 17	14	18-42-17	7,030	5
	2000	26, 27	17	18-34-42	511	0
	2000	19	14	18-42-23	0	0
	2000	13	14	18-34-35	2,024	0
	2000	13	14	18-34-45	0	1
	2000	27	17	18-31-11	3,312	1
	2000	27	17	18-31-10	3,060	1
		Total		14 codes	46,193	15
Between-years[b]	1999	1	14	18-08-48	2,587	
	2000	30	17		952	
				Subtotal	3,539	1
	1999	3	14	18-15-63	1,857	
	2000	23, 24	17		1,745	
				Subtotal	3,602	5
		Total		2 codes	7,141	6

[a] Tag code mislabeling occurred between codes used within the same year and stock region.
[b] Accidental repeated tag code usage occurred with 1999 and 2000 Strait of Georgia releases.

Appendix C. Summary of herring CWT releases from 1999 to 2003 by region, location, date, set number, Area and tag code batch with subsequent 2003 tag recoveries.

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Strait of Georgia									
Fillongley Park	2-Mar-99	1	14	Bi	18-08-48 [c]			3,539	1
Whalebone Pt	4-Mar-99	2	14	Bi	18-08-56			3,751	2
Phipps Pt	4-Mar-99	3	14	Bi	18-15-63 [c]			3,602	5
Bowser	5-Mar-99	4	14	Bi	02-60-10			3,006	2
Qualicum Bay	6-Mar-99	5	14	Bi	18-12-33			3,590	2
Qualicum Bay	6-Mar-99	6	14	Bi	18-02-04			3,670	2
Metcalfe Bay	7-Mar-99	7	14	Bi	18-14-34			675	0
Chrome Is	9-Mar-99	8	14	Bi	18-12-35			1,644	0
Link Is	15-Mar-99	9	17	Bi	18-12-07			1,964	0
Jesse Is	15-Mar-99	10	17	Bi	02-63-44			3,597	1
McKay Pt	16-Mar-99	11	17	Bi	18-12-34			3,370	2
Link Is	18-Mar-99	12	17	Bi	18-12-32 [d]			2,505	0
Link Is	18-Mar-99	12	17	Bi	08-24-19			153	0
Link Is	18-Mar-99	12	17	Bi	18-38-12			760	0
French Creek	18-Mar-99	13	14	Bi	18-12-13 [d]			3,310	1
French Creek	19-Mar-99	14	14	Bi	08-16-11			3,438	0
French Creek	19-Mar-99	15	14	Bi	02-19-27			3,413	0
Link Is	20-Mar-99	16	17	Bi	08-16-09			4,422	0
Strait of Georgia								50,409	18
Total between-year discrepant tags								7,141	6
Total minus discrepant tags								43,268	12
Queen Charlotte Islands									
Wanderer Is	26-Mar-99	17	2E	Bi	18-02-25			1,141	0
Wanderer Is	27-Mar-99	18	2E	Bi	18-11-55			920	0
Wanderer Is	27-Mar-99	18	2E	Bi	18-11-50			1,082	0
Wanderer Is	28-Mar-99	19	2E	Bi	18-18-34			1,600	0
Wanderer Is	28-Mar-99	19	2E	Bi	18-14-16			1,432	0
Queen Charlotte Islands								6,175	0
Strait of Georgia									
Fillongley Park	26-Feb-00	1	14	Bi	08-16-10			18,963	9
Fillongley Park	27-Feb-00	3	14	Bi	12-19-50			13,472	7
Big Qualicum	29-Feb-00	4	14	Bi	18-12-31			1,932	0
Big Qualicum	29-Feb-00	4	14	Bi	02-16-57			9,197	1
Big Qualicum	29-Feb-00	4	14	Bi	02-15-40			2,175	0
Boyle Pt	3-Mar-00	5	14	Bi	02-13-12 [d]			3,017	0
Boyle Pt	3-Mar-00	5	14	Bi	18-14-43 [d]			3,454	1
Boyle Pt	3-Mar-00	5	14	Bi	12-22-45			4,809	0
Boyle Pt	3-Mar-00	6	14	Bi	02-22-11			342	0

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Boyle Pt	3-Mar-00	6	14	Bi	08-24-47			4,945	0
Boyle Pt	3-Mar-00	6	14	Bi	02-03-12			2,478	0
Boyle Pt	3-Mar-00	6	14	Bi	08-25-05			2,081	0
Boyle Pt	3-Mar-00	6	14	Bi	08-26-31R			5,643	2
Repulse Pt	3-Mar-00	7	14	Bi	02-18-63			6,416	3
Repulse Pt	3-Mar-00	7	14	Bi	02-22-21			6,764	1
Tribune Bay	5-Mar-00	9	14	Bi	08-16-06			16,100	3
Helliwell Park	6-Mar-00	11	14	Bi	18-42-17 [d]			7,030	5
Helliwell Park	6-Mar-00	11	14	Bi	18-03-34 [d]			6,356	1
Qualicum Bay	6-Mar-00	12	14	Bi	08-24-17			2,286	1
Qualicum Bay	6-Mar-00	12	14	Bi	18-32-45			2,464	2
Parksville Bay	7-Mar-00	13	14	Bi	02-13-56			2,382	0
Parksville Bay	7-Mar-00	13	14	Bi	18-34-35 [d]			2,024	0
Parksville Bay	7-Mar-00	13	14	Bi	18-14-21 [d]			1,906	2
Parksville Bay	7-Mar-00	13	14	Bi	18-34-45 [d]			0	1
Parksville Bay	7-Mar-00	13	14	Bi	02-60-34			1,651	2
Parksville Bay	7-Mar-00	14	14	Bi	02-28-06			1,910	2
Parksville Bay	7-Mar-00	14	14	Bi	18-12-19 [d]			2,506	0
Parksville Bay	7-Mar-00	14	14	Bi	02-12-12 [d]			9,108	4
Parksville Bay	7-Mar-00	14	14	Bi	18-04-35			2,130	1
Parksville Bay	7-Mar-00	14	14	Bi	02-48-43			2,725	0
Parksville Bay	7-Mar-00	15	14	Bi	18-35-14			637	0
Parksville Bay	7-Mar-00	15	14	Bi	18-11-54			1,669	1
Parksville Bay	7-Mar-00	15	14	Bi	18-15-08			2,070	0
Parksville Bay	7-Mar-00	15	14	Bi	08-24-18			1,560	0
French Creek	8-Mar-00	16	14	Bi	18-15-59			2,109	2
French Creek	8-Mar-00	17	14	Bi	18-08-46			1,007	0
French Creek	8-Mar-00	17	14	Bi	18-29-61			569	0
French Creek	8-Mar-00	18	14	Bi	18-31-13			1,627	1
French Creek	8-Mar-00	18	14	Bi	18-19-32			1,582	1
French Creek	8-Mar-00	18	14	Bi	18-30-03			1,443	0
French Creek	8-Mar-00	18	14	Bi	18-31-14			700	1
French Creek	8-Mar-00	18	14	Bi	18-13-61			1,203	0
French Creek	8-Mar-00	18	14	Bi	18-03-51			927	0
French Creek	8-Mar-00	18	14	Bi	18-11-56			1,060	1
French Creek	8-Mar-00	18	14	Bi	18-11-51			1,120	0
Longbeak Pt	9-Mar-00	19	14	Bi	18-34-42 [d]			511	0
Longbeak Pt	9-Mar-00	19	14	Bi	02-62-10			1,871	0
Longbeak Pt	9-Mar-00	19	14	Bi	18-37-34			3,555	3
Longbeak Pt	9-Mar-00	19	14	Bi	18-37-27			3,356	1
Longbeak Pt	9-Mar-00	19	14	Bi	18-42-04			1,192	0
Longbeak Pt	9-Mar-00	19	14	Bi	18-42-23 [d]			0	0
Longbeak Pt	9-Mar-00	19	14	Bi	02-36-07			384	0

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	Tag Sequence To	Tags per Code	Recovs in 2003
Longbeak Pt	9-Mar-00	20	14	Bi	18-19-33			672	0
Longbeak Pt	9-Mar-00	20	14	Bi	18-34-28			3,717	2
Longbeak Pt	9-Mar-00	20	14	Bi	18-01-52			806	0
Longbeak Pt	9-Mar-00	20	14	Bi	18-31-08			3,428	2
Northwest Bay	11-Mar-00	21	14	Bi	18-42-01			1,372	1
Northwest Bay	11-Mar-00	21	14	Bi	18-03-44			287	0
Yellow Pt	14-Mar-00	22	17	Bi	18-08-50			4,393	3
Yellow Pt	14-Mar-00	22	17	Bi	18-34-41			631	1
Yellow Pt	14-Mar-00	22	17	Bi	18-34-30			3,234	1
Link Is	14-Mar-00	23	17	Bi	18-34-47			1,428	2
Link Is	14-Mar-00	23	17	Bi	18-03-47			2,287	0
Link Is	14-Mar-00	23	17	Bi	18-12-41			1,936	2
Yellow Pt	15-Mar-00	25	17	Bi	18-37-30			3,426	4
Link Is	16-Mar-00	26	17	Bi	18-32-42			565	0
Link Is	16-Mar-00	26	17	Bi	18-34-29			660	2
Link Is	16-Mar-00	26	17	Bi	18-34-39			573	0
Link Is	16-Mar-00	26	17	Bi	18-28-05			2,424	5
Link Is	16-Mar-00	26	17	Bi	18-31-09			2,852	2
Hammond Bay	20-Mar-00	27	17	Bi	18-39-32			309	0
Hammond Bay	20-Mar-00	27	17	Bi	18-31-10 [d]			3,060	1
Hammond Bay	20-Mar-00	27	17	Bi	18-38-24			3,116	0
Hammond Bay	20-Mar-00	27	17	Bi	18-30-63			238	0
Hammond Bay	20-Mar-00	27	17	Bi	18-31-11 [d]			3,312	1
Mudge Is	21-Mar-00	28	17	Bi	18-34-31			1,025	0
Mudge Is	21-Mar-00	28	17	Bi	18-36-33			1,338	0
Mudge Is	21-Mar-00	28	17	Bi	02-11-16			1,052	0
Mudge Is	21-Mar-00	28	17	Bi	18-03-32			820	0
Nanoose	22-Mar-00	29	17	Bi	18-37-26			1,870	0
Nanoose	22-Mar-00	29	17	Bi	18-37-28			2,746	0
Nanoose	22-Mar-00	29	17	Bi	18-31-12			1,099	0
Nanoose	22-Mar-00	30	17	Bi	18-35-01			900	1
Nanoose	22-Mar-00	30	17	Bi	18-37-29			3,617	1
Icarus Pt	23-Mar-00	31	17	Bi	18-32-33			1,743	1
Icarus Pt	23-Mar-00	31	17	Bi	18-32-40			2,127	1
Icarus Pt	23-Mar-00	31	17	Bi	18-42-06			560	0
Schooner Cove	24-Mar-00	32	17	Bi	18-32-41			1,960	1
Schooner Cove	24-Mar-00	32	17	Bi	18-32-21			869	0
Schooner Cove	24-Mar-00	32	17	Bi	18-42-22			819	0
Schooner Cove	24-Mar-00	32	17	Bi	18-35-20			785	0
Schooner Cove	24-Mar-00	32	17	Bi	18-35-02			1,220	1
Straight of Georgia								245,694	94

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Strait of Georgia									
Bowser	4-Mar-01	1	14	Bi	02-63-20			8,457	5
Bowser	4-Mar-01	3	14	Bi	02-44-58			1,394	1
Bowser	4-Mar-01	3	14	Bi	18-09-37			2,323	3
Bowser	5-Mar-01	4	14	Bi	18-01-53			1,230	1
Bowser	5-Mar-01	4	14	Bi	08-24-44			1,382	0
Bowser	5-Mar-01	4	14	Bi	18-08-20			501	0
Cape Lazo	5-Mar-01	5	14	Bi	18-08-45			2,075	4
Cape Lazo	5-Mar-01	5	14	Bi	18-02-38			2,367	5
Cape Lazo	5-Mar-01	5	14	Bi	18-01-40			2,574	4
Cape Lazo	6-Mar-01	6	14	Bi	18-39-10			2,819	6
Cape Lazo	6-Mar-01	6	14	Bi	02-12-63			2,923	2
Cape Lazo	6-Mar-01	6	14	Bi	18-21-23			2,348	2
Cape Lazo	6-Mar-01	7	14	Bi	18-28-31			4,016	2
Cape Lazo	6-Mar-01	7	14	Bi	08-24-41			2,470	4
Lambert Ch	7-Mar-01	9	14	Bi	18-22-60			2,643	4
Lambert Ch	7-Mar-01	9	14	Bi	18-19-45			3,393	3
Lambert Ch	7-Mar-01	9	14	Bi	18-39-02			3,066	8
Little Qualicum	8-Mar-01	12	14	Bi	18-16-54			2,434	2
Little Qualicum	8-Mar-01	12	14	Bi	18-07-38			4,770	5
Qualicum	8-Mar-01	13	14	Bi	18-34-46			2,798	1
French Creek	10-Mar-01	16	14	Bi	08-25-14R			2,713	0
French Creek	10-Mar-01	16	14	Bi	02-02-61R			1,862	3
Strait of Georgia								60,558	65
Prince Rupert District									
Kitkatla	22-Mar-01	18	5	Bi	18-20-25			156	0
Kitkatla	22-Mar-01	18	5	Bi	18-34-16			1,220	1
Kitkatla	22-Mar-01	18	5	Bi	02-05-24			2,413	3
Kitkatla	22-Mar-01	18	5	Bi	02-50-50			2,681	4
Kitkatla	22-Mar-01	19	5	Bi	02-02-62R			1,946	7
Kitkatla	22-Mar-01	20	5	Bi	02-55-42R			1,396	5
Kitkatla	23-Mar-01	21	5	Bi	02-10-47			2,591	3
Kitkatla	23-Mar-01	21	5	Bi	02-41-28			3,256	6
Kitkatla	23-Mar-01	21	5	Bi	02-41-31			2,428	3
Kitkatla	24-Mar-01	23	5	Bi	18-28-39			1,301	5
Kitkatla	24-Mar-01	23	5	Bi	18-08-23			1,407	3
Kitkatla	24-Mar-01	23	5	Bi	18-04-05			1,592	4
Casey Cove	28-Mar-01	24	4	Bi	18-33-57			1,618	1
Casey Cove	28-Mar-01	24	4	Bi	18-41-26			1,257	2
Casey Cove	28-Mar-01	24	4	Bi	18-28-38			1,295	1
Metford Is	28-Mar-01	25	4	Bi	18-20-27			1,994	0
Metford Is	28-Mar-01	25	4	Bi	18-20-29			2,259	2

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Metford Is	28-Mar-01	25	4	Bi	18-34-56			2,455	2
Garden Is	29-Mar-01	26	4	Bi	18-14-20			2,491	7
Garden Is	29-Mar-01	26	4	Bi	18-38-22			2,576	5
Garden Is	29-Mar-01	26	4	Bi	18-16-11			2,376	3
Garden Is	30-Mar-01	27	4	Bi	18-08-53			2,039	0
Garden Is	30-Mar-01	27	4	Bi	18-28-59			1,618	0
Garden Is	30-Mar-01	27	4	Bi	18-28-26			1,681	2
Venn Pass	31-Mar-01	28	4	Bi	02-24-09			4,359	11
Venn Pass	31-Mar-01	28	4	Bi	02-11-40			2,025	2
Venn Pass	31-Mar-01	29	4	Bi	02-56-61R			2,045	2
Venn Pass	31-Mar-01	29	4	Bi	28-16-03			4,275	4
Big Bay	31-Mar-01	30	4	Bi	02-41-29			2,220	4
Big Bay	31-Mar-01	30	4	Bi	02-41-30			1,896	5
Big Bay	31-Mar-01	30	4	Bi	02-55-54			2,013	6
Venn Pass	1-Apr-01	31	4	Bi	08-24-40			3,634	1
Venn Pass	1-Apr-01	31	4	Bi	08-24-62			4,501	1
Venn Pass	1-Apr-01	31	4	Bi	08-24-61			4,373	4
Venn Pass	2-Apr-01	33	4	Bi	02-30-12			5,734	2
Venn Pass	2-Apr-01	33	4	Bi	18-38-47			3,105	2
Garden Is	2-Apr-01	35	4	Bi	02-36-09			1,970	1
Prince Rupert District								88,196	114
Strait of Georgia									
Norris Rock	5-Mar-02	1	14	BiSq	08-12-01	240	2,403	1,039	0
Norris Rock	5-Mar-02	1	14	BiSq	08-12-03	237	2,207	934	0
Norris Rock	5-Mar-02	1	14	BiSq	08-12-04	235	1,987	759	1
Norris Rock	5-Mar-02	1	14	BiSq	08-12-02	217	2,574	1,176	1
Gartley Pt	6-Mar-02	2	14	BiSq	08-12-03	2,210	5,152	1,556	1
Gartley Pt	6-Mar-02	2	14	BiSq	08-12-04	1,995	4,434	1,152	2
Gartley Pt	6-Mar-02	2	14	BiSq	08-12-02	2,678	5,734	1,660	4
Gartley Pt	6-Mar-02	2	14	BiSq	08-12-01	2,407	4,694	1,217	1
Goosespit	6-Mar-02	3	14	BiSq	08-12-01	4,848	6,541	901	2
Goosespit	6-Mar-02	3	14	BiSq	08-12-03	5,228	7,187	1,045	5
Goosespit	6-Mar-02	3	14	BiSq	08-12-02	6,000	9,069	1,192	4
Goosespit	6-Mar-02	3	14	BiSq	08-12-04	4,515	6,372	985	2
Seal Islets	8-Mar-02	4	14	BiSq	08-12-01	6,548	10,571	2,156	3
Seal Islets	8-Mar-02	4	14	BiSq	08-12-04	6,383	10,727	2,385	3
Seal Islets	8-Mar-02	4	14	BiSq	08-12-02	9,078	13,233	2,260	10
Seal Islets	8-Mar-02	4	14	BiSq	08-12-03	7,192	11,828	2,287	8
Longbeak Pt	8-Mar-02	5	14	BiSq	08-12-05	208	625	149	1
Longbeak Pt	8-Mar-02	5	14	BiSq	08-12-08	222	832	257	0
Longbeak Pt	8-Mar-02	5	14	BiSq	08-12-04	10,729	14,000	1,700	2
Longbeak Pt	8-Mar-02	5	14	BiSq	08-12-06	210	3,566	1,845	6

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	Tag Sequence To	Tags per Code	Recovs in 2003
Longbeak Pt	8-Mar-02	5	14	BiSq	08-12-01	10,575	14,000	1,691	0
Longbeak Pt	8-Mar-02	5	14	BiSq	08-12-07	173	1,456	624	2
Longbeak Pt	8-Mar-02	5	14	BiSq	08-12-03	11,837	13,774	1,073	0
Sandy Is	11-Mar-02	6	14	BiSq	08-12-05	636	1,690	544	3
Sandy Is	11-Mar-02	6	14	BiSq	08-12-06	5,117	10,194	2,806	4
Sandy Is	11-Mar-02	6	14	BiSq	08-12-08	836	2,031	625	1
Sandy Is	11-Mar-02	6	14	BiSq	08-12-07	1,646	2,690	529	0
Sandy Is	11-Mar-02	6	14	BiSq	08-12-07	2,693	7,156	2,382	4
Sandy Is	11-Mar-02	6	14	BiSq	08-12-08	2,034	7,260	2,642	8
Sandy Is	11-Mar-02	6	14	BiSq	08-12-06	3,568	5,115	817	1
Goosespit	11-Mar-02	7	14	BiSq	08-12-05	1,763	5,799	2,241	6
Repulse Pt	15-Mar-02	8	14	BiSq	08-12-08	7,263	8,429	605	1
Repulse Pt	15-Mar-02	8	14	BiSq	08-12-06	10,197	11,673	829	0
Repulse Pt	15-Mar-02	8	14	BiSq	08-12-05	5,808	7,039	639	0
Repulse Pt	15-Mar-02	8	14	BiSq	08-12-07	7,165	8,357	622	0
Gravelly Bay	15-Mar-02	9	14	BiSq	08-12-05	7,048	9,903	1,544	0
Gravelly Bay	15-Mar-02	9	14	BiSq	08-12-07	8,362	11,446	1,671	0
Gravelly Bay	15-Mar-02	9	14	BiSq	08-12-06	11,759	13,219	772	1
Gravelly Bay	15-Mar-02	9	14	BiSq	08-12-08	8,437	11,896	1,896	1
Gravelly Bay	15-Mar-02	9	14	BiSq	08-12-09	117	2,265	1,067	1
French Creek	16-Mar-02	10	14	BiSq	08-12-05	9,907	12,361	1,267	1
French Creek	16-Mar-02	10	14	BiSq	08-12-08	11,902	13,571	876	3
French Creek	16-Mar-02	10	14	BiSq	08-12-09	2,271	4,138	655	0
French Creek	16-Mar-02	10	14	BiSq	08-12-07	11,452	13,693	1,204	2
French Creek	17-Mar-02	11	14	BiSq	08-12-09	4,139	8,100	2,165	1
French Creek	17-Mar-02	11	14	Bi	18-32-44			2,099	1
French Creek	17-Mar-02	11	14	Bi	08-01-24			1,637	0
French Creek	17-Mar-02	11	14	BiSq	08-12-05	12,367	13,243	439	0
French Creek	17-Mar-02	11	14	BiSq	08-12-10	240	3,815	1,908	0
Shingle Spit	17-Mar-02	12	14	BiSq	08-12-09	8,104	13,591	2,865	2
Shingle Spit	17-Mar-02	12	14	BiSq	08-12-10	3,816	8,336	2,433	2
Shingle Spit	17-Mar-02	12	14	Bi	08-25-04R			5,440	5
Comox Buoy	19-Mar-02	13	14	Bi	18-38-23			1,345	1
Comox Buoy	19-Mar-02	13	14	Bi	18-22-58			4,845	1
Comox Buoy	19-Mar-02	13	14	BiSq	08-12-10	8,342	12,213	2,076	2
Strait of Georgia								83,528	110
Central Coast									
Kwakshua Channel	20-Mar-02	14	8	Bi	18-37-31			1,771	0
Kwakshua Channel	21-Mar-02	15	8	Bi	08-24-35			3,612	0
Kwakshua Channel	21-Mar-02	15	8	Bi	18-37-32			4,080	1
Norman Morrison	21-Mar-02	16	7	Bi	02-25-46			3,868	2
Norman Morrison	21-Mar-02	16	7	Bi	18-39-18			3,904	5

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Berry Inlet	22-Mar-02	17	7	Bi	18-38-59			4,201	19
Berry Inlet	22-Mar-02	17	7	Bi	18-38-61			4,158	23
Lockhart Bay	22-Mar-02	18	7	Bi	18-38-57			3,697	4
Lockhart Bay	22-Mar-02	18	7	Bi	18-02-46			3,464	4
Spiller Channel	23-Mar-02	19	7	Bi	18-28-48			3,595	13
Spiller Channel	23-Mar-02	19	7	Bi	18-42-57			460	3
Spiller Channel	23-Mar-02	19	7	Bi	18-15-28			3,680	16
Kitasu Bay	24-Mar-02	20	6	Bi	18-12-11			3,737	29
Kitasu Bay	24-Mar-02	20	6	Bi	18-35-22			733	4
Kitasu Bay	24-Mar-02	20	6	Bi	08-01-33			4,572	41
Kitasu Bay	25-Mar-02	21	6	Bi	18-14-14			3,539	33
Kitasu Bay	25-Mar-02	21	6	Bi	18-39-35			712	3
Kitasu Bay	25-Mar-02	21	6	Bi	08-25-02R			4,875	49
Central Coast								58,658	249
Prince Rupert District									
Big Bay	26-Mar-02	22	4	Bi	18-04-38			3,016	4
Big Bay	26-Mar-02	22	4	Bi	08-24-60			2,920	4
Big Bay	27-Mar-02	23	4	Bi	08-25-16R			4,194	11
Big Bay	27-Mar-02	23	4	Bi	18-07-56			3,992	11
Big Bay	27-Mar-02	24	4	Bi	18-39-03			3,479	6
Big Bay	27-Mar-02	24	4	Bi	18-03-49			3,157	7
Big Bay	27-Mar-02	24	4	Bi	18-35-03			259	0
Big Bay	27-Mar-02	25	4	Bi	18-35-08			507	0
Big Bay	27-Mar-02	25	4	Bi	08-25-07R			3,393	2
Big Bay	27-Mar-02	25	4	Bi	02-19-28			3,033	2
Big Bay	28-Mar-02	26	4	Bi	18-38-58			4,124	5
Big Bay	28-Mar-02	26	4	Bi	02-38-27			4,200	2
Big Bay	28-Mar-02	27	4	Bi	18-39-34			348	4
Big Bay	28-Mar-02	27	4	Bi	18-04-40			7,778	12
Big Bay	28-Mar-02	28	4	Bi	18-24-63			4,560	8
Kitkatla Inlet	31-Mar-02	29	5	Bi	18-28-47			4,055	7
Kitkatla Inlet	31-Mar-02	29	5	Bi	02-38-26			4,064	20
Kitkatla Inlet	1-Apr-02	30	5	Bi	18-35-17			725	5
Kitkatla Inlet	1-Apr-02	30	5	Bi	08-25-13R			2,825	8
Kitkatla Inlet	1-Apr-02	30	5	Bi	18-35-07			847	3
Kitkatla Inlet	1-Apr-02	30	5	Bi	18-35-15			1,502	5
Willis Bay	1-Apr-02	31	5	Bi	02-56-62R			1,173	3
Willis Bay	1-Apr-02	31	5	Bi	18-28-46			1,478	5
Willis Bay	1-Apr-02	32	5	Bi	02-08-26			3,638	6
Willis Bay	1-Apr-02	32	5	Bi	18-33-54			3,617	6
Willis Bay	2-Apr-02	33	5	Bi	18-33-26			448	1
Willis Bay	2-Apr-02	33	5	Bi	18-35-09			421	1

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Willis Bay	2-Apr-02	33	5	Bi	18-35-18			374	0
Willis Bay	2-Apr-02	33	5	Bi	18-39-31			534	4
Wilson Inlet	2-Apr-02	34	5	Bi	02-21-16			11,081	13
Prince Rupert District								85,742	165
Strait of Georgia									
Secret Cove	5-Mar-03	1	16	Bi	18-08-51			2,822	0
Secret Cove	5-Mar-03	1	16	BiSq	08-08-14	10,334	11,848	876	0
Secret Cove	5-Mar-03	1	16	BiSq	08-01-60	9,985	12,272	1,246	0
Secret Cove	5-Mar-03	1	16	BiSq	08-01-60	5,805	7,681	957	1
Secret Cove	5-Mar-03	1	16	BiSq	08-08-14	5,687	7,064	742	0
Madrona Pt	7-Mar-03	2	14	BiSq	08-08-14	11,965	13,637	888	0
Madrona Pt	7-Mar-03	2	14	Bi	18-27-45			2,512	0
Madrona Pt	7-Mar-03	2	14	Bi	18-43-02			798	1
Madrona Pt	7-Mar-03	2	14	Bi	18-31-07			3,721	1
Madrona Pt	7-Mar-03	2	14	BiSq	08-01-60	12,350	13,515	436	0
Madrona Pt	7-Mar-03	2	14	Bi	18-35-36			462	0
Madrona Pt	7-Mar-03	2	14	BiSq	08-01-60	7,811	9,822	1,046	1
Madrona Pt	7-Mar-03	2	14	BiSq	08-08-14	7,073	9,157	1,114	0
Madrona Pt	7-Mar-03	2	14	Bi	02-63-53			1,724	0
Madrona Pt	7-Mar-03	3	14	BiSq	08-01-01	165	2,214	906	0
Madrona Pt	7-Mar-03	3	14	BiSq	08-01-59	10,525	13,330	1,121	1
Madrona Pt	7-Mar-03	3	14	DeSq	08-14-04	257	2,612	887	1
Madrona Pt	7-Mar-03	3	14	DeSq	08-14-04	15,332	18,377	989	1
Mistaken Is	10-Mar-03	4	14	Bi	18-11-48			869	0
Mistaken Is	10-Mar-03	4	14	DeSq	08-14-04	2,652	5,788	1,129	1
Mistaken Is	10-Mar-03	4	14	BiSq	08-01-01	2,212	4,500	793	1
Mistaken Is	10-Mar-03	4	14	Bi	18-27-62			658	0
Mistaken Is	10-Mar-03	4	14	DeSq	08-14-04	18,588	20,703	863	2
Mistaken Is	10-Mar-03	4	14	DeSq	08-14-01	269	3,613	1,021	0
Mistaken Is	10-Mar-03	4	14	Bi	18-19-50			2,397	3
Mistaken Is	10-Mar-03	4	14	Bi	18-42-44			679	0
Mistaken Is	10-Mar-03	4	14	Bi	18-32-59			1,963	0
Mistaken Is	10-Mar-03	4	14	Bi	18-32-06			1,061	3
Brant Pt	11-Mar-03	5	14	DeSq	08-14-04	5,789	6,771	355	0
Brant Pt	11-Mar-03	5	14	DeSq	08-14-01	15,117	16,320	290	0
Brant Pt	11-Mar-03	5	14	DeSq	08-14-04	20,782	21,773	298	0
Brant Pt	11-Mar-03	5	14	DeSq	08-14-01	3,614	4,647	260	0
Brant Pt	11-Mar-03	6	14	DeSq	08-14-01	16,321	18,915	961	0
Brant Pt	11-Mar-03	6	14	DeSq	08-14-01	4,648	7,139	960	0
Brant Pt	11-Mar-03	6	14	DeSq	08-14-04	6,772	9,430	1,077	0
Brant Pt	11-Mar-03	6	14	DeSq	08-14-04	21,775	24,113	909	0
Baynes Snd	16-Mar-03	7	14	Bi	18-43-45			1,877	3

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Baynes Snd	16-Mar-03	7	14	DeSq	08-14-01	18,916	21,694	929	0
Baynes Snd	16-Mar-03	7	14	DeSq	08-14-04	24,114	26,690	928	1
Baynes Snd	16-Mar-03	7	14	Bi	02-37-09			1,146	1
Baynes Snd	16-Mar-03	7	14	DeSq	08-14-01	7,140	10,121	1,100	1
Baynes Snd	16-Mar-03	7	14	DeSq	08-14-04	9,431	12,550	1,209	1
Baynes Snd	16-Mar-03	7	14	Bi	08-43-33			4,083	3
Longbeak Pt	16-Mar-03	8	14	Bi	02-54-36			944	0
Longbeak Pt	16-Mar-03	8	14	Bi	18-21-17			921	1
Longbeak Pt	16-Mar-03	8	14	DeSq	08-14-04	26,691	29,800	963	1
Longbeak Pt	16-Mar-03	8	14	Bi	18-45-19			2,510	0
Longbeak Pt	16-Mar-03	8	14	Bi	18-38-06			2,085	0
Longbeak Pt	16-Mar-03	8	14	DeSq	08-14-04	12,551	14,875	964	0
Longbeak Pt	16-Mar-03	8	14	DeSq	08-14-01	10,122	13,136	1,103	0
Longbeak Pt	16-Mar-03	8	14	DeSq	08-14-01	21,695	24,219	860	0
Longbeak Pt	16-Mar-03	8	14	Bi	18-43-46			2,001	0
Longbeak Pt	16-Mar-03	9	14	DeSq	08-14-01	13,137	14,875	516	0
Longbeak Pt	16-Mar-03	9	14	Bi	18-45-41			3,581	0
Longbeak Pt	16-Mar-03	9	14	DeSq	08-14-01	24,220	26,813	966	1
Longbeak Pt	16-Mar-03	9	14	Bi	18-21-13			1,170	0
Longbeak Pt	16-Mar-03	9	14	Bi	18-39-58			262	0
Longbeak Pt	16-Mar-03	9	14	DeSq	08-14-02	14,876	17,342	937	1
Longbeak Pt	16-Mar-03	9	14	DeSq	08-14-02	0	2,690	905	1
Chrome Is	17-Mar-03	10	14	Bi	18-31-57			984	0
Chrome Is	17-Mar-03	10	14	DeSq	08-14-03	0	2,927	1,009	1
Chrome Is	17-Mar-03	10	14	DeSq	08-14-01	26,814	29,800	961	0
Chrome Is	17-Mar-03	10	14	Bi	02-30-20			1,007	0
Chrome Is	17-Mar-03	10	14	Bi	18-01-48			643	1
Chrome Is	17-Mar-03	10	14	Bi	02-04-21			917	0
Chrome Is	17-Mar-03	10	14	DeSq	08-14-02	2,691	5,346	992	0
Chrome Is	17-Mar-03	10	14	Bi	18-45-45			2,867	3
Chrome Is	17-Mar-03	10	14	Bi	18-46-08			785	1
Chrome Is	17-Mar-03	10	14	DeSq	08-14-02	17,343	20,431	1,207	1
Repulse Pt	17-Mar-03	11	14	DeSq	08-14-03	14,876	17,450	875	0
Repulse Pt	17-Mar-03	11	14	Bi	02-38-28			1,935	0
Repulse Pt	17-Mar-03	11	14	DeSq	08-14-03	2,928	5,684	1,019	0
Repulse Pt	17-Mar-03	11	14	Bi	18-33-09			2,315	0
Repulse Pt	17-Mar-03	11	14	DeSq	08-14-02	20,432	23,672	1,301	0
Repulse Pt	17-Mar-03	11	14	Bi	18-38-51			2,040	0
Repulse Pt	17-Mar-03	11	14	Bi	18-21-53			2,241	0
Repulse Pt	17-Mar-03	11	14	DeSq	08-14-02	5,347	8,102	1,042	0
Strait of Georgia								95,890	39

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Central Coast									
Goose Bay	20-Mar-03	12	9	Bi	18-45-47			2,977	0
Goose Bay	20-Mar-03	12	9	Bi	08-24-54			3,809	0
Goose Bay	20-Mar-03	12	9	DeSq	08-14-03	17,451	20,242	1,014	0
Goose Bay	20-Mar-03	12	9	Bi	18-35-51			443	0
Goose Bay	20-Mar-03	12	9	Bi	18-35-62			456	0
Goose Bay	20-Mar-03	12	9	DeSq	08-14-02	23,673	26,946	1,299	0
Goose Bay	20-Mar-03	12	9	Bi	18-36-42			581	0
Goose Bay	20-Mar-03	12	9	Bi	18-39-54			410	0
Goose Bay	20-Mar-03	12	9	Bi	18-35-53			845	0
Goose Bay	20-Mar-03	12	9	DeSq	08-14-03	5,685	7,737	728	0
Goose Bay	20-Mar-03	12	9	DeSq	08-14-02	8,103	11,117	1,098	0
Illahie Inlet	20-Mar-03	13	9	Bi	18-44-48			397	0
Illahie Inlet	20-Mar-03	13	9	De	18-46-40			1,859	0
Illahie Inlet	20-Mar-03	13	9	De	18-46-42			2,479	0
Illahie Inlet	20-Mar-03	13	9	DeSq	08-13-03	20,243	22,345	801	0
Illahie Inlet	20-Mar-03	13	9	DeSq	08-14-03	7,738	10,484	1,095	0
Illahie Inlet	20-Mar-03	13	9	Bi	18-42-21			771	0
Illahie Inlet	20-Mar-03	13	9	Bi	18-32-17			1,608	0
Illahie Inlet	20-Mar-03	13	9	DeSq	08-14-02	26,947	29,800	958	0
Illahie Inlet	20-Mar-03	13	9	DeSq	08-14-02	11,118	13,840	1,062	0
Illahie Inlet	20-Mar-03	13	9	De	18-49-08			4,393	0
Kwakshua Channel	21-Mar-03	14	8	Bi	02-07-58			2,368	0
Kwakshua Channel	21-Mar-03	14	8	Bi	08-26-21R			2,273	0
Kwakshua Channel	21-Mar-03	14	8	DeSq	08-14-05	14,876	17,180	799	0
Kwakshua Channel	21-Mar-03	14	8	DeSq	08-14-05	0	2,221	783	0
Kwakshua Channel	21-Mar-03	14	8	DeSq	08-14-02	13,841	14,875	183	0
Kwakshua Channel	21-Mar-03	14	8	DeSq	08-14-03	22,346	24,861	931	0
Kwakshua Channel	21-Mar-03	14	8	DeSq	08-14-03	10,485	13,055	971	0
Kwakshua Channel	21-Mar-03	14	8	Bi	02-59-12			2,057	0
Kwakshua Channel	21-Mar-03	14	8	Bi	18-40-44			1,665	0
Kildidt Snd	22-Mar-03	15	7	Bi	18-45-61			1,989	0
Kildidt Snd	22-Mar-03	15	7	Bi	18-46-28			1,381	0
Kildidt Snd	22-Mar-03	15	7	Bi	18-40-14			362	0
Kildidt Snd	22-Mar-03	15	7	Bi	18-38-52			2,108	0
Kildidt Snd	22-Mar-03	15	7	DeSq	08-14-05	17,181	20,042	1,015	0
Kildidt Snd	22-Mar-03	15	7	DeSq	08-14-05	2,222	4,548	916	0
Kildidt Snd	22-Mar-03	15	7	DeSq	08-14-03	24,862	27,224	811	0
Kildidt Snd	22-Mar-03	15	7	DeSq	08-14-03	13,056	14,875	550	0
Lockhart Bay	23-Mar-03	16	7	DeSq	08-14-05	4,549	6,710	861	0
Lockhart Bay	23-Mar-03	16	7	DeSq	08-14-03	27,225	29,800	787	0
Lockhart Bay	23-Mar-03	16	7	Bi	02-59-07R			2,214	0
Lockhart Bay	23-Mar-03	16	7	Bi	18-32-36			1,307	0

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	Tag Sequence To	Tags per Code	Recovs in 2003
Lockhart Bay	23-Mar-03	16	7	Bi	18-38-03			1,949	0
Lockhart Bay	23-Mar-03	16	7	DeSq	08-14-05	20,043	23,068	1,189	0
Lockhart Bay	23-Mar-03	16	7	BiSq	08-11-01	0	2,150	1,029	0
Lockhart Bay	23-Mar-03	16	7	Bi	18-18-35			1,854	0
Lockhart Bay	23-Mar-03	16	7	Bi	18-04-52			1,354	0
Lockhart Bay	23-Mar-03	16	7	Bi	18-48-29			998	0
Spiller Channel	23-Mar-03	17	7	Bi	02-61-59			2,679	0
Spiller Channel	23-Mar-03	17	7	DeSq	08-14-05	23,069	26,291	1,181	0
Spiller Channel	23-Mar-03	17	7	BiSq	08-11-01	2,151	4,075	1,014	0
Spiller Channel	23-Mar-03	17	7	BiSq	08-11-02	0	2,041	901	0
Spiller Channel	23-Mar-03	17	7	Bi	02-44-40			2,668	0
Spiller Channel	23-Mar-03	17	7	DeSq	08-14-05	6,711	8,908	876	0
Spiller Channel	23-Mar-03	17	7	Bi	08-08-11			4,275	0
Neekas Inlet	24-Mar-03	18	7	BiSq	08-11-01	4,076	5,823	936	0
Neekas Inlet	24-Mar-03	18	7	BiSq	08-11-02	2,042	3,666	923	0
Neekas Inlet	24-Mar-03	18	7	Bi	18-37-39			1,249	0
Neekas Inlet	24-Mar-03	18	7	Bi	18-39-33			405	0
Neekas Inlet	24-Mar-03	18	7	Bi	18-40-20			287	0
Neekas Inlet	24-Mar-03	18	7	Bi	18-35-61			321	0
Neekas Inlet	24-Mar-03	18	7	Bi	18-40-23			218	0
Neekas Inlet	24-Mar-03	18	7	Bi	18-23-40			1,452	0
Neekas Inlet	24-Mar-03	18	7	Bi	18-44-05			1,691	0
Neekas Inlet	24-Mar-03	18	7	Bi	18-43-09			4,043	0
Neekas Inlet	24-Mar-03	18	7	DeSq	08-14-05	26,292	29,800	1,031	0
Neekas Inlet	24-Mar-03	18	7	Bi	02-38-24			1,041	0
Neekas Inlet	24-Mar-03	18	7	DeSq	08-14-05	8,909	11,768	1,106	0
Berry Inlet	24-Mar-03	19	7	BiSq	08-11-01	5,824	7,765	1,040	0
Berry Inlet	24-Mar-03	19	7	Bi	18-44-43			1,385	0
Berry Inlet	24-Mar-03	19	7	Bi	08-07-12			1,303	0
Berry Inlet	24-Mar-03	19	7	Bi	18-08-43			1,139	0
Berry Inlet	24-Mar-03	19	7	Bi	02-63-51			2,453	0
Berry Inlet	24-Mar-03	19	7	DeSq	08-14-05	11,769	14,875	1,050	0
Berry Inlet	24-Mar-03	19	7	Bi	18-20-28			1,331	0
Berry Inlet	24-Mar-03	19	7	BiSq	08-11-02	3,667	5,658	1,039	0
Berry Inlet	24-Mar-03	19	7	BiSq	08-11-03	0	2,141	999	2
East Higgins Pass	25-Mar-03	20	7	Bi	18-35-21			508	21
East Higgins Pass	25-Mar-03	20	7	BiSq	08-11-01	7,766	9,865	1,136	21
East Higgins Pass	25-Mar-03	20	7	Bi	02-07-36			2,208	39
East Higgins Pass	25-Mar-03	20	7	Bi	18-19-47			3,950	73
East Higgins Pass	25-Mar-03	20	7	BiSq	08-11-03	2,124	4,418	1,182	26
East Higgins Pass	25-Mar-03	20	7	Bi	18-33-17			535	6
East Higgins Pass	25-Mar-03	20	7	BiSq	08-11-04	0	2,679	1,400	23
East Higgins Pass	25-Mar-03	20	7	Bi	18-33-24			330	1

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East Higgins Pass	25-Mar-03	20	7	Bi	02-31-27			1,099	18
East Higgins Pass	25-Mar-03	20	7	Bi	18-35-23			437	14
East Higgins Pass	25-Mar-03	20	7	BiSq	08-11-02	5,659	7,730	1,068	19
East Higgins Pass	25-Mar-03	20	7	Bi	18-16-56			1,666	31
Central Coast								119,342	294
Prince Rupert District									
Gurd Pt	27-Mar-03	21	5	BiSq	08-11-04	2,680	4,831	1,166	0
Gurd Pt	27-Mar-03	21	5	Bi	02-57-34			1,475	0
Gurd Pt	27-Mar-03	21	5	Bi	18-04-34			1,335	0
Gurd Pt	27-Mar-03	21	5	BiSq	08-11-01	9,866	11,819	982	0
Gurd Pt	27-Mar-03	21	5	Bi	18-48-46			2,005	0
Gurd Pt	27-Mar-03	21	5	Bi	02-48-44			1,941	0
Gurd Pt	27-Mar-03	21	5	BiSq	08-11-03	4,419	6,385	979	0
Gurd Pt	27-Mar-03	21	5	Bi	18-47-15			1,834	0
Gurd Pt	27-Mar-03	21	5	BiSq	08-11-02	7,731	9,662	935	0
Gurd Pt	27-Mar-03	21	5	Bi	18-15-06			1,443	0
Gurd Pt	27-Mar-03	22	5	BiSq	08-11-04	4,832	6,983	1,174	0
Gurd Pt	27-Mar-03	22	5	Bi	08-27-16			1,635	0
Gurd Pt	27-Mar-03	22	5	Bi	18-46-30			1,458	0
Gurd Pt	27-Mar-03	22	5	Bi	18-08-52			3,519	0
Gurd Pt	27-Mar-03	22	5	Bi	18-03-58			1,545	0
Gurd Pt	27-Mar-03	22	5	Bi	02-60-21			1,546	0
Gurd Pt	27-Mar-03	22	5	BiSq	08-11-01	11,820	14,000	1,043	0
Gurd Pt	27-Mar-03	22	5	BiSq	08-11-03	6,386	8,567	1,134	0
Gurd Pt	27-Mar-03	22	5	BiSq	08-11-02	9,663	11,655	1,038	0
Dries Inlet	27-Mar-03	23	5	BiSq	08-11-04	6,984	9,342	1,300	0
Dries Inlet	27-Mar-03	23	5	Bi	18-28-25			2,210	0
Dries Inlet	27-Mar-03	23	5	Bi	18-31-21			1,224	0
Dries Inlet	27-Mar-03	23	5	Bi	18-31-51			1,110	0
Dries Inlet	27-Mar-03	23	5	BiSq	08-11-03	8,568	10,683	1,136	0
Dries Inlet	27-Mar-03	23	5	BiSq	08-11-02	11,656	14,000	1,179	0
Dries Inlet	27-Mar-03	23	5	BiSq	08-11-05	0	2,480	1,244	0
Cunningham Pass	31-Mar-03	24	4	Bi	18-48-28			1,011	0
Cunningham Pass	31-Mar-03	24	4	BiSq	08-11-06	0	2,114	956	0
Cunningham Pass	31-Mar-03	24	4	Bi	18-45-46			3,155	0
Cunningham Pass	31-Mar-03	24	4	BiSq	08-11-05	2,481	4,665	1,097	0
Cunningham Pass	31-Mar-03	24	4	BiSq	08-11-04	9,343	11,649	1,242	0
Cunningham Pass	31-Mar-03	24	4	Bi	18-18-21			2,087	0
Cunningham Pass	31-Mar-03	24	4	Bi	18-48-53			2,928	0
Cunningham Pass	31-Mar-03	24	4	Bi	08-08-06			1,485	0
Cunningham Pass	31-Mar-03	24	4	BiSq	08-11-03	10,684	12,953	1,105	0
Porcher Peninsula	1-Apr-03	25	5	Bi	18-19-49			3,156	0

Location	Date	Set [a]	Area	Tag [b] Type	Tag Code	Tag Sequence From	To	Tags per Code	Recovs in 2003
Porcher Peninsula	1-Apr-03	25	5	Bi	18-45-28			1,965	0
Porcher Peninsula	1-Apr-03	25	5	Bi	18-28-37			1,503	0
Porcher Peninsula	1-Apr-03	25	5	BiSq	08-11-06	2,115	4,562	1,212	0
Porcher Peninsula	1-Apr-03	25	5	BiSq	08-11-05	4,666	6,893	1,087	0
Porcher Peninsula	1-Apr-03	25	5	BiSq	08-11-04	11,650	14,000	1,154	0
Porcher Peninsula	1-Apr-03	25	5	BiSq	08-11-03	12,954	14,000	285	0
Porcher Peninsula	1-Apr-03	25	5	BiSq	08-11-07	0	1,861	876	0
Porcher Peninsula	1-Apr-03	25	5	Bi	18-23-46			4,053	0
Porcher Peninsula	1-Apr-03	26	5	Bi	18-44-45			1,476	0
Porcher Peninsula	1-Apr-03	26	5	BiSq	08-11-05	6,894	8,975	1,113	0
Porcher Peninsula	1-Apr-03	26	5	Bi	18-01-36			3,402	0
Porcher Peninsula	1-Apr-03	26	5	Bi	02-53-11			1,650	0
Porcher Peninsula	1-Apr-03	26	5	BiSq	08-11-08	0	2,408	1,254	0
Porcher Peninsula	1-Apr-03	26	5	Bi	18-43-16			3,096	0
Porcher Peninsula	1-Apr-03	26	5	BiSq	08-11-06	4,563	6,747	1,126	0
Porcher Peninsula	1-Apr-03	26	5	BiSq	08-11-07	1,862	4,194	1,262	0
Porcher Peninsula	2-Apr-03	27	5	BiSq	08-11-07	4,195	6,628	1,139	0
Porcher Peninsula	2-Apr-03	27	5	BiSq	08-11-05	8,976	10,974	1,080	0
Porcher Peninsula	2-Apr-03	27	5	BiSq	08-11-06	6,748	8,799	1,101	0
Porcher Peninsula	2-Apr-03	27	5	BiSq	08-11-08	2,409	4,739	1,301	0
Porcher Peninsula	2-Apr-03	27	5	Bi	18-14-44			3,234	0
Porcher Peninsula	2-Apr-03	27	5	Bi	02-41-27			2,280	0
Porcher Peninsula	2-Apr-03	27	5	Bi	18-33-53			2,254	0
Porcher Peninsula	2-Apr-03	27	5	Bi	02-61-37			3,076	0
Gurd Pt	2-Apr-03	28	5	Bi	18-39-55			793	0
Gurd Pt	2-Apr-03	28	5	BiSq	08-11-05	10,975	12,988	1,079	0
Gurd Pt	2-Apr-03	28	5	Bi	18-08-22			1,575	0
Gurd Pt	2-Apr-03	28	5	Bi	18-18-36			1,505	0
Gurd Pt	2-Apr-03	28	5	BiSq	08-11-06	8,800	10,844	1,045	0
Gurd Pt	2-Apr-03	28	5	Bi	18-38-48			1,688	0
Gurd Pt	2-Apr-03	28	5	BiSq	08-11-07	6,629	8,755	1,144	0
Gurd Pt	2-Apr-03	28	5	Bi	18-43-37			1,560	0
Gurd Pt	2-Apr-03	28	5	BiSq	08-11-08	4,740	7,467	1,519	0
Gurd Pt	2-Apr-03	28	5	Bi	18-15-11			1,801	0
Prince Rupert District								111,500	0
Total 1999 to 2003 all regions								1,005,692	1,148

[a] Some codes from 1999 to 2001 were released from more than one tagging set (but having similar vicinities and dates) but only the first set is presented in this table; however, the number of releases under "Tags per Code" are the total for each code, all release sets combined.
[b] Binary batch (Bi), binary-sequential (BiSq), decimal batch (De) and decimal-sequential (DeSq) CWT codes were used.
[c] Accidental repeated tag code usage occurred with some 1999 and 2000 releases (Appendix B).
[d] Tag code mislabeling occurred between codes used within the same year and assessment region (Appendix B).

Appendix D.1. Summary of 2000 CWT recoveries by assessment region, Area and fishing gear relative to releases. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			QCI	PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	WCVI	Total
	Area			2E	5	3, 4	7	7	14	14	23	24	25	25	
	Gear			SN	SN	GN	SN	GN	SN	GN	SN	SN	SN	GN	
	Total Catch (mt)			1,765	1,239	3,075	6,394	972	6,455	7,593	496	190	240	700	29,119
	Tonnage Searched (mt)			141.0	171	242	1,908	248	1,947	1,333	155	121	0	57	6,321
	Catch Searched (%)			8.0	13.8	7.9	29.8	25.5	30.2	17.6	31.3	63.6	0.0	8.2	21.7
Release Year	Region	Area	Tags Released												
1999	QCI	2E	6,175	4	-	-	-	1	-	-	-	-	-	-	5
	SG	14	27,631	-	-	-	-	-	53	29	-	1	-	-	83
	SG	17	14,266	-	-	-	-	-	16	12	-	1	-	-	29
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	6	4	-	-	-	-	10
2000	SG	14 BGN	109,440	-	-	-	-	-	274	129	-	-	-	-	403
	SG	14 AGN	73,806	-	-	-	-	-	-	-	-	-	-	-	-
	SG	17 AGN	65,145	-	-	-	-	-	-	-	-	-	-	-	-
All	All		302,278	4	-	-	-	1	349	174	-	2	-	-	530

BGN refers to tags released before the gillnet fishery had closed in the region (which was after the seine closure).
AGN refers to tags released after the gillnet fishery was closed in the region.
The sums for 1999 and 2000 releases differ from future recovery years because 2000 use of between-year discrepant codes had not occurred prior to 2000 roe herring fisheries.

Appendix D.2. Estimates of 2000 CWT recovery rates (percentage of the released tags recovered) by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			QCI	PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	WCVI	Total
	Area			2E	5	3, 4	7	7	14	14	23	24	25	25	
	Gear			SN	SN	GN	SN	GN	SN	GN	SN	SN	SN	GN	
	Total Catch (mt)			1,765	1,239	3,075	6,394	972	6,455	7,593	496	190	240	700	29,119
	Tonnage Searched (mt)			141	171	242	1,908	248	1,947	1,333	155	121	0	57	6,321
	Catch Searched (%)			8.0	13.8	7.9	29.8	25.5	30.2	17.6	31.3	63.6	0.0	8.2	21.7
Release Year	Region	Area	Tags Released												
1999	QCI	2E	6,175	0.06	-	-	-	0.02	-	-	-	-	-	-	0.08
	SG	14	27,631	-	-	-	-	-	0.19	0.10	-	<0.01	-	-	0.30
	SG	17	14,266	-	-	-	-	-	0.11	0.06	-	0.01	-	-	0.20
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	0.10	0.07	-	-	-	-	0.17
2000	SG	14 BGN	109,440	-	-	-	-	-	0.25	0.12	-	-	-	-	0.37
	SG	14 AGN	73,806	-	-	-	-	-	-	-	-	-	-	-	-
	SG	17 AGN	65,145	-	-	-	-	-	-	-	-	-	-	-	-

BGN refers to tags released before the gillnet fishery had closed in the region (which was after the seine closure).
AGN refers to tags released after the gillnet fishery was closed in the region.
The sums for 1999 and 2000 releases differ from future recovery years because 2000 use of between-year discrepant codes had not occurred prior to 2000 roe herring fisheries.

Appendix D.3. Estimates of 2000 tag densities (CWTs recovered per tonne of roe herring searched) by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			QCI	PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	WCVI
	Area			2E	5	3, 4	7	7	14	14	23	24	25	25
	Gear			SN	SN	GN	SN	GN	SN	GN	SN	SN	SN	GN
	Total Catch (mt)			1,765	1,239	3,075	6,394	972	6,455	7,593	496	190	240	700
	Tonnage searched (mt)			141	171	242	1,908	248	1,947	1,333	155	121	0	57
	Catch Searched (%)			8.0	13.8	7.9	29.8	25.5	30.2	17.6	31.3	63.6	0.0	8.2
Release			Tags											
Year	Region	Area	Released											
1999	QCI	2E	6,175	0.028	-	-	-	0.004	-	-	-	-	-	-
	SG	14	27,631	-	-	-	-	-	0.027	0.022	-	0.008	-	-
	SG	17	14,266	-	-	-	-	-	0.008	0.009	-	0.008	-	-
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	0.003	0.003	-	-	-	-
2000	SG	14 BGN	109,440	-	-	-	-	-	0.141	0.097	-	-	-	-
	SG	14 AGN	73,806	-	-	-	-	-	-	-	-	-	-	-
	SG	17 AGN	65,145	-	-	-	-	-	-	-	-	-	-	-
All	All		302,278	0.028	-	-	-	0.004	0.179	0.131	-	0.017	-	-

BGN refers to tags released before the gillnet fishery had closed in the region (which was after the seine closure).
AGN refers to tags released after the gillnet fishery was closed in the region.
The sums for 1999 and 2000 releases differ from future recovery years because 2000 use of between-year discrepant codes had not occurred prior to 2000 roe herring fisheries.

Appendix D.4. Estimates of 2000 CWT removals by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			QCI	PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	WCVI	Total
	Area			2E	5	3, 4	7	7	14	14	23	24	25	25	
	Gear			SN	SN	GN	SN	GN	SN	GN	SN	SN	SN	GN	
	Total Catch (mt)			1,765	1,239	3,075	6,394	972	6,455	7,593	496	190	240	700	29,119
	Tonnage Searched (mt)			141	171	242	1,908	248	1,947	1,333	155	121	0	57	6,321
	Catch Searched (%)			8.0	13.8	7.9	29.8	25.5	30.2	17.6	31.3	63.6	0.0	8.2	21.7
Release Year	Region	Area	Tags Released												
1999	QCI	2E	6,175	50	-	-	-	4	-	-	-	-	-	-	54
	SG	14	27,631	-	-	-	-	-	176	165	-	2	-	-	343
	SG	17	14,266	-	-	-	-	-	53	68	-	2	-	-	123
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	20	23	-	-	-	-	43
2000	SG	14 BGN	109,440	-	-	-	-	-	908	735	-	-	-	-	1643
	SG	14 AGN	73,806	-	-	-	-	-	-	-	-	-	-	-	-
	SG	17 AGN	65,145	-	-	-	-	-	-	-	-	-	-	-	-
All	All	All	302,278	50	-	-	-	4	1157	991	-	3	-	-	2206

BGN refers to tags released before the gillnet fishery had closed in the region (which was after the seine closure).
AGN refers to tags released after the gillnet fishery was closed in the region.
The sums for 1999 and 2000 releases differ from future recovery years because 2000 use of between-year discrepant codes had not occurred prior to 2000 roe herring fisheries.

Appendix D.5. Estimates of 2000 CWT removal rates (percentage of the released tags removed) from all roe herring catches by assessment region, Area and fishing gear. Total catch, catch tonnage and the percentage of catch searched are also shown.

Recovery	Region			QCI	PRD	PRD	CC	CC	SG	SG	WCVI	WCVI	WCVI	WCVI	Total
	Area			2E	5	3, 4	7	7	14	14	23	24	25	25	
	Gear			SN	SN	GN	SN	GN	SN	GN	SN	SN	SN	GN	
	Total Catch (mt)			1,765	1,239	3,075	6,394	972	6,455	7,593	496	190	240	700	29,119
	Tonnage Searched (mt)			141	171	242	1,908	248	1,947	1,333	155	121	0	57	6,321
	Catch Searched (%)			8.0	13.8	7.9	29.8	25.5	30.2	17.6	31.3	63.6	0.0	8.2	21.7
Release Year	Region	Area	Tags Released												
1999	QCI	2E	6,175	0.81	-	-	-	0.06	-	-	-	-	-	-	0.88
	SG	14	27,631	-	-	-	-	-	0.64	0.60	-	0.01		-	1.24
	SG	17	14,266	-	-	-	-	-	0.37	0.48	-	0.01	-		0.86
1999 WYD	SG	14 or 17	5,815	-	-	-	-	-	0.34	0.39	-	-	-	-	0.73
2000	SG	14 BGN	109,440	-	-	-	-	-	0.83	0.67	-	-	-	-	1.50
	SG	14 AGN	73,806	-	-	-	-	-	-	-	-	-	-	-	-
	SG	17 AGN	65,145	-	-	-	-	-	-	-	-	-	-	-	-

BGN refers to tags released before the gillnet fishery had closed in the region (which was after the seine closure).
AGN refers to tags released after the gillnet fishery was closed in the region.
The sums for 1999 and 2000 releases differ from future recovery years because 2000 use of between-year discrepant codes had not occurred prior to 2000 roe herring fisheries.

Appendix E.1. Summary of 2001 CWT recoveries by assessment region, Area and fishing gear relative to releases. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG	Total
	Area			4	5	7	7	14	14	
	Gear			GN	SN	GN	SN	SN	GN	
	Total Catch (mt)			1,905.5	1,012.2	517.3	5,613.1	7,275.5	7,682.4	24,005.9
	Tonnage Searched (mt)			205.9	71.7	178.7	2,153.7	2,086.6	2,225.4	6,921.9
	Catch Searched (%)			10.8	7.1	34.6	38.4	28.7	29.0	28.8
Release			Tags							
Year	Region	Area	Released							
1999	QCI	2E	6,175	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	20	42	62
	SG	17	14,266	-	-	-	-	7	15	22
1999 WYD	SG	14 or 17	5,815	-	-	-	-	5	10	15
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	5	10	15
2000	SG	14	180,229	-	-	-	1	96	155	252
	SG	17	58,994	-	-	-	-	36	41	77
2000 WYD	SG	14 or 17	6,471	-	-	-	-	5	3	8
2001	PRD	4 BGN	65,809	44	-	-	-	-	-	44
	PRD	5 BSN	18,087	-	-	-	-	-	-	-
	PRD	5 ASN	4,300	-	3	-	-	-	-	3
	SG	14 BGN	55,983	-	-	-	-	-	84	84
	SG	14 AGN	4,575	-	-	-	-	-	-	-
All	All		451,032	44	3	-	1	174	360	582

BGN refers to tags released before the gillnet fishery had closed in the region.
BSN refers to tags released before the seine fishery had closed in the region.
AGN refers to tags released after the gillnet fishery was closed in the region.
ASN refers to tags released after the seine fishery was closed in the region.

Appendix E.2. Estimates of 2001 CWT recovery rates (percentage of the released tags recovered) by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG	Total
	Area			4	5	7	7	14	14	
	Gear			GN	SN	GN	SN	SN	GN	
	Total Catch (mt)			1,905.5	1,012.2	517.3	5,613.1	7,275.5	7,682.4	24,005.9
	Tonnage Searched (mt)			205.9	71.7	178.7	2,153.7	2,086.6	2,225.4	6,921.9
	Catch Searched (%)			10.8	7.1	34.6	38.4	28.7	29.0	28.8
Release Year	Region	Area	Tags Released							
1999	QCI	2E	6,175	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	0.09	0.18	0.27
	SG	17	14,266	-	-	-	-	0.05	0.11	0.15
1999 WYD	SG	14 or 17	5,815	-	-	-	-	0.09	0.17	0.26
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	0.07	0.14	0.21
				-	-	-	-	-	-	-
2000	SG	14	180,229	-	-	-	<0.01	0.05	0.09	0.14
	SG	17	58,994	-	-	-	-	0.06	0.07	0.13
2000 WYD	SG	14 or 17	6,471	-	-	-	-	0.08	0.05	0.12
2001	PRD	4 BGN	65,809	0.07	-	-	-	-	-	0.07
	PRD	5 BSN	18,087	-	-	-	-	-	-	-
	PRD	5 ASN	4,300	-	0.07	-	-	-	-	0.07
	SG	14 BGN	55,983	-	-	-	-	-	0.15	0.15
	SG	14 AGN	4,575	-	-	-	-	-	-	-

BGN refers to tags released before the gillnet fishery had closed in the region.
BSN refers to tags released before the seine fishery had closed in the region.
AGN refers to tags released after the gillnet fishery was closed in the region.
ASN refers to tags released after the seine fishery was closed in the region.

Appendix E.3. Estimates of 2001 tag densities (CWTs recovered per tonne of roe herring searched) by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG
	Area			4	5	7	7	14	14
	Gear			GN	SN	GN	SN	SN	GN
	Total Catch (mt)			1,905.5	1,012.2	517.3	5,613.1	7,275.5	7,682.4
	Tonnage Searched (mt)			205.9	71.7	178.7	2,153.7	2,086.6	2,225.4
	Catch Searched (%)			10.8	7.1	34.6	38.4	28.7	29.0
Release Year	Region	Area	Tags Released						
1999	QCI	2E	6,175	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	0.010	0.019
	SG	17	14,266	-	-	-	-	0.003	0.007
1999 WYD	SG	14 or 17	5,815	-	-	-	-	0.002	0.004
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	0.002	0.004
2000	SG	14	180,229	-	-	-	<0.001	0.046	0.070
	SG	17	58,994	-	-	-	-	0.017	0.018
2000 WYD	SG	14 or 17	6,471	-	-	-	-	0.002	0.001
2001	PRD	4 BGN	65,809	0.214	-	-	-	-	-
	PRD	5 BSN	18,087	-	-	-	-	-	-
	PRD	5 ASN	4,300	-	0.042	-	-	-	-
	SG	14 BGN	55,983	-	-	-	-	-	0.038
	SG	14 AGN	4,575	-	-	-	-	-	-
All	All		451,032	0.214	0.042	-	<0.001	0.083	0.124

BGN refers to tags released before the gillnet fishery had closed in the region.
BSN refers to tags released before the seine fishery had closed in the region.
AGN refers to tags released after the gillnet fishery was closed in the region.
ASN refers to tags released after the seine fishery was closed in the region.

Appendix E.4. Estimates of 2001 CWT removals by assessment region, Area and fishing gear. Total catch, catch tonnage searched and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG	Total
	Area			4	5	7	7	14	14	
	Gear			GN	SN	GN	SN	SN	GN	
	Total Catch (mt)			1,905.5	1,012.2	517.3	5,613.1	7,275.5	7,682.4	24,005.9
	Tonnage Searched (mt)			205.9	71.7	178.7	2,153.7	2,086.6	2,225.4	6,921.9
	Catch Searched (%)			10.8	7.1	34.6	38.4	28.7	29.0	28.8
Release			Tags							
Year	Region	Area	Released							
1999	QCI	2E	6,175	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	70	145	215
	SG	17	14,266	-	-	-	-	24	52	76
1999 WYD	SG	14 or 17	5,815	-	-	-	-	17	35	52
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	17	35	52
2000	SG	14	180,229	-	-	-	3	335	535	872
	SG	17	58,994	-	-	-	-	126	142	267
2000 WYD	SG	14 or 17	6,471	-	-	-	-	17	10	28
2001	PRD	4 BGN	65,809	407	-	-	-	-	-	407
	PRD	5 BSN	18,087	-	-	-	-	-	-	-
	PRD	5 ASN	4,300	-	42	-	-	-	-	42
	SG	14 BGN	55,983	-	-	-	-	-	290	290
	SG	14 AGN	4,575	-	-	-	-	-	-	-
All	All		451,032	407	42	-	3	607	1,243	2,302

BGN refers to tags released before the gillnet fishery had closed in the region.
BSN refers to tags released before the seine fishery had closed in the region.
AGN refers to tags released after the gillnet fishery was closed in the region.
ASN refers to tags released after the seine fishery was closed in the region.

Appendix E.5. Estimates of 2001 CWT removal rates (percentage of the released tags removed) from all roe herring catches by assessment region, Area and fishing gear. Total catch, catch tonnage and the percentage of catch searched are also shown.

Recovery	Region			PRD	PRD	CC	CC	SG	SG	Total
	Area			4	5	7	7	14	14	
	Gear			GN	SN	GN	SN	SN	GN	
	Total Catch (mt)			1,905.5	1,012.2	517.3	5,613.1	7,275.5	7,682.4	24,005.9
	Tonnage Searched (mt)			205.9	71.7	178.7	2,153.7	2,086.6	2,225.4	6,921.9
	Catch Searched (%)			10.8	7.1	34.6	38.4	28.7	29.0	28.8
Release			Tags							
Year	Region	Area	Released							
1999	QCI	2E	6,175	-	-	-	-	-	-	-
	SG	14	23,187	-	-	-	-	0.30	0.63	0.93
	SG	17	14,266	-	-	-	-	0.17	0.36	0.53
1999 WYD	SG	14 or 17	5,815	-	-	-	-	0.30	0.59	0.89
1999/2000 BYD	SG	14 or 17	7,141	-	-	-	-	0.24	0.48	0.73
2000	SG	14	180,229	-	-	-	0.00	0.19	0.30	0.48
	SG	17	58,994	-	-	-	-	0.21	0.24	0.45
2000 WYD	SG	14 or 17	6,471	-	-	-	-	0.27	0.16	0.43
2001	PRD	4 BGN	65,809	0.62	-	-	-	-	-	0.62
	PRD	5 BSN	18,087	-	-	-	-	-	-	-
	PRD	5 ASN	4,300	-	0.99	-	-	-	-	0.99
	SG	14 BGN	55,983	-	-	-	-	-	0.52	0.52
	SG	14 AGN	4,575	-	-	-	-	-	-	-
All	All		451,032	0.62	0.99	-	0.00	1.68	3.28	6.57

BGN refers to tags released before the gillnet fishery had closed in the region.
BSN refers to tags released before the seine fishery had closed in the region.
AGN refers to tags released after the gillnet fishery was closed in the region.
ASN refers to tags released after the seine fishery was closed in the region.